

INTENTION AS A FUNCTION OF OUTCOME EVALUATIONS AND BELIEFS:
INFLUENCE OF ATTITUDES AND SUBJECTIVE NORMS ON BEHAVIORAL
INTENTION TO ACQUIRE ORAL CONTRACEPTIVES OVER-THE-COUNTER

By

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by

Rajesh Nayak

This manuscript is dedicated to the loving memory of my father, Vishwanath Nayak, the man who inculcated in me the value of education, discipline and hard work. Some people inspire and motivate others more in their demise than when they are alive, in ways unfathomable to collective human wisdom. My father is one of them. He taught me more through his silence than through his words. I will always be indebted to him for his kindness, understanding, and his tacit approval of every decision I have made in my life. This work would never have seen the light of the day had it not been for his constant encouragement.

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Abstract of Dissertation Presented to the Graduate School
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The study examined the utility of the theory of reasoned action (TRA) for explaining university women's intention to acquire oral contraceptives (OCs) over-the-counter (OTC). Results indicated that a woman's intention to acquire oral contraceptives without a prescription was mainly determined by her beliefs concerning the possible risks and benefits of using OCs and her perception of what her key referents (family, friends, and partner) would think about her acquiring OCs without a prescription. Physiological side effects and the pill's perceived benefits were the major considerations that entered into women's decisions to acquire or not to acquire OCs over-the-counter. All women in the sample (N=294) believed that using OCs would lead to negative outcomes (such as nausea, weight gain). There was no overall difference between women who intended to acquire OCs over-the-counter and those who did not in the way they evaluated the risks

and benefits of using OCs. Instead, the difference between the two groups stemmed from their perceived likelihood of the possible outcomes.

The amount of variation in intention explained by the indirect measures of attitudes and subjective norm was only 7 percent, whereas about 50 percent of the variation in intention was explained by the use of direct measures of these constructs. Only 37 percent of the respondents surveyed reported intention to acquire OCs over-the-counter. A majority of the women in the study expressed a favorable attitude toward the beneficial aspects of OTC oral contraceptives and negative attitudes toward the risky consequences arising from their use. A very low correlation was found ($0.075, p=0.199$) between the perception of risk and intention scores, whereas a positive and significant correlation ($0.188, p=0.001$) was found between perception of benefits and intention to acquire OCs OTC.

The study provided only a moderate support for the TRA. The findings of the study support the following general conclusions. First, women who express more favorable attitudes toward acquiring OCs OTC report stronger intentions to acquire OCs over-the-counter. Second, women's attitudes are a stronger determinant of intention to acquire OCs over-the-counter than are their perceptions of normative support among key referents. Third, women's attitudes toward the beneficial consequences of using OCs OTC are a better predictor of behavioral intention than are their attitudes toward risky consequences. Fourth, TRA seems to work best when attitudes and subjective norms are measured directly than when they are derived multiplicatively.

CHAPTER 1 INTRODUCTION

Problem Statement

As oral contraceptives (OCs) enter their 38th year of prescription status, the question of whether women should be able to obtain them without a prescription has come to the forefront of issues related to women's reproductive health care. Currently 18 million American women are known to use birth control pills on a regular basis, with 80% of them expected to use OCs during their lives (Dawson, 1990). According to a survey conducted by Ortho Pharmaceuticals (1993), OCs are rated as the most preferred birth control method by women and they remain the most popular method in the United States. Consequently, the way in which OCs are made available to the general public has been a matter of interest to the policy makers, researchers, and educators. Health policy analysts have suggested a change in the existing system of prescription-only availability for oral contraceptives in the United States. They have suggested switching oral contraceptives to a nonprescription status (Grimes, 1993; Trussell et al., 1993; Potts and Denny, 1995; The Tan Sheet, March 29, 1993).

The available evidence indicates that women are divided in their preference for obtaining birth control pills without a prescription. While some women are reported to favor close medical supervision over the acquisition of OCs, others are believed to be in support of a system that provides no mandatory medical supervision over the sale and use

of OCs (Nayak et al., 1994). Conflicting evidence in this regard, gathered mainly through national opinion polls (Gallup Poll, 1985, 1994; Taylor et al., 1994), provides no insight into why women may have varying preferences for obtaining birth control pills. At the core of the discussion concerning the availability of oral contraceptives without mandatory medical authorization are concerns related to safety and efficacy, dangers of side effects, economic costs, and perceived social barriers. Social interests such as patient autonomy, self-care, reduction in the incidence of teenage pregnancies, and prevention of promiscuity may also be viewed as significant to justify the prescription status for OCs. For example, some women feel that making OCs available without a prescription might lead to more women, especially adolescents, having sexual encounters, while others feel that such a step might even reduce teenage pregnancies in the US (Nayak et al., 1994).

Current evidence indicates that women have differing beliefs about the means of acquiring OCs (Nayak et al., 1994). Some beliefs about the biomedical aspects of using OCs relate to their direct effects on the body, such as experiencing side effects, or incidence of certain types of cancer. In addition, some women, when asked about an option of possibly acquiring pills over-the-counter (OTC), seem to hold beliefs that are somewhat different than when they are told of no such option. For example, some women believe that obtaining OCs without a prescription might lead to undesirable health problems (Nayak et al., 1994). OTC status might mean foregoing some routine physical examination, risking imperfect use, or not being able to take advantage of the professional oversight of their use (Nayak et al., 1994; Grimes, 1993; Trussell et al., 1993). These beliefs are considered indirect because they do not relate to the beliefs about the physical effects of OCs on the body. Instead, they relate to the psychosocial

consequences of acquiring them through a mode that is not considered traditional. Also viewed to be significant in the acquisition of OCs with or without professional supervision are women's beliefs about the cost and convenience of obtaining them from two different sources.

The social psychology literature holds that beliefs usually translate into corresponding attitudes. Specifically, in the current context, women's beliefs regarding the means of acquiring OCs from different sources would be expected to shape their attitudes toward the same. This study, therefore, proposes to systematically investigate these attitudes and thereby explain any preference for a system of acquiring OCs in a certain way. In addition, the determinants of women's preferences for the current or the proposed new status for oral contraceptives are currently unknown. Therefore, this study seeks to examine the factors that relate to women's preferences for acquiring OCs from different sources.

Background

Available evidence indicates that women are divided in their opinions about obtaining oral contraceptives and contraceptive services from different sources (Gallup Poll, 1985, 1994; Taylor et al., 1994; Nayak et al., 1994). While some women are known to favor medical supervision over the acquisition of pills, others are not opposed to a system that provides them with greater control, rights and responsibilities. For example, our preliminary research in this area suggests this duality of preferences (Nayak et al., 1994). While some women were reported to prefer the status quo of medical authority, others preferred to obtain OCs under their own authority. The question of why women have differing preferences for the acquisition of OCs is unanswered at this time.

Preliminary findings suggest that women's preferences for acquiring OCs differ mainly due to the differing beliefs they hold. While some beliefs corresponded to their preference for a submission to medical supervision, others indicate a preference for autonomy.

Besides the beliefs referred to above by the women interviewed, the beliefs that are generally held by others are also viewed to be significant to OC acquisition in the US. A misconception about the use of OCs and their possible side effects seems to continue among the OC users and nonusers alike (Gallup Poll, 1985, 1994). Interestingly, according to these polls, beliefs about the negative aspects of OC use, such as the side effects of OCs, were found to be more prevalent among OC users than nonusers. The known side effects of the drug include pain in the legs, vision defects, breakthrough bleeding, weight gain, and sometimes even risks of stroke (Grimes, 1992). Despite their convenience, effectiveness, and reversibility of action, oral contraceptives in recent years have also sparked some debate about their link with cancer risk. One of the major risks of using pills, either real or commonly believed to be true, is the susceptibility of an individual to various types of ovarian and endometrial cancers, as well as breast cancer. OC users in particular, as the polls above indicated, seemed to hold more negative beliefs about the risks of cancer than did nonusers. The preliminary investigation also supported similar findings (Nayak et al., 1994). Conflicting scientific evidence regarding the incidence of cancer among OC users, especially those of ovaries and breasts, continue to be reported to this date. No comprehensive insight, however, is available today as to whether women's perceptions and attitudes regarding cancer risks are shaped by

scientific reports and/or personal experiences. The issue of whether or not OCs really cause certain types of cancer is still unresolved at this time.

Women's perceptions regarding the acquisition of OCs are also shaped by their beliefs about the economic costs of obtaining them. Some women fear that insurance policies that cover prescription drugs may no longer pay for OCs or OC-related services (Nayak et al., 1994). Yet, from the standpoint of costs, it might be less expensive to obtain OCs when they are sold through unrestricted channels because women may no longer have to pay large physician fees (Nayak et al., 1994). According to some health policy analysts, it might mean that nonprescription status for OCs might also threaten the survival of those nonprofit family planning clinics that rely heavily on the reimbursement associated with contraceptive distribution (Trussell et al., 1993). From the societal perspective, it is the general belief that unrestricted availability of OCs might actually lead to unprotected sex among those who use pills, especially the teenagers (Nayak et al., 1994). Preliminary findings also suggested that women who held positive beliefs about acquiring OCs in a particular way seemed to hold positive attitudes about acquiring them through that way. For example, women who believed that it was less expensive to acquire OCs without a prescription thought it was less risky to use them if acquired that way, and were more predisposed to acquiring them without a prescription. In contrast, those who harbored unfavorable beliefs seemed to hold unfavorable attitudes toward the means of acquiring them a particular way. In addition, some women who thought it was safe to obtain OCs without a prescription were willing to acquire them if the current situation made it possible to obtain them with no prescription. Thus, it seems that women's beliefs and attitudes about acquiring pills are sometimes at odds with those of

the society in general and policy makers. While some beliefs and attitudes are shaped by personal experiences, others are dictated by situational constraints.

It can be argued, based on the foregoing discussion, that a woman's beliefs about benefits of obtaining OCs in a particular way, her beliefs about the health risks involved, her beliefs about the cost of alternatives, and her beliefs about possible social consequences can be expected to correlate with her general attitude toward the act of acquiring them a certain way. While the current evidence points to the possible influence of some, if not all, of these belief components, it is not known which of these components are really important in choices a woman might make regarding obtaining OCs from alternate sources. Consequently, it is the purpose of this research to investigate the role of underlying factors that may shape and influence a woman's attitude toward obtaining oral contraceptives in a particular way.

Rationale for the Study

Recently, a Harris Poll sponsored by a California foundation (Taylor et al., 1994) indicated support for the OTC pills among young women surveyed, whereas women surveyed by Gallup Organization (1994) reported a clear lack of support for an OTC pill. A poll commissioned by American College of Obstetricians and Gynecologists, conducted by Gallup Organization (March 1, 1985), points to some important discrepancies between available scientific evidence and public understanding of oral contraceptives. A similar poll conducted by Gallup 9 years later (January, 1994) reported somewhat similar findings, however, with a substantial shift in women's attitude toward OTC oral contraceptives. According to this survey, which was conducted through

telephone interviews of 997 women 18 and over, 86 percent overall and 91 percent of women on birth control pills didn't believe that OCs were safe enough to buy without first seeing a doctor. However, there was a substantial decrease in the percentage of women (compared to the 1985 poll), down to 54 percent from 76 percent, who felt there were substantial risks associated with the use of OCs. Furthermore, 29 percent of women cited cancer as the chief risk, as did 31% in 1985, followed by birth defects, heart attacks and blood clots. Interestingly, while 41 percent of women polled did not believe in health benefits of OCs other than the prevention of pregnancy itself, only 6 percent were even aware of OCs' protection against certain types of cancer. The percentage of women who thought, rather unfortunately, that using OCs was more risky or as risky as childbirth stayed almost constant at 65 percent. However, the message that emerged clearly from this report was that, during the passage of time, fewer women actually thought oral contraceptives carried substantial health risks. The findings also reflect misconceptions about oral contraceptives among women, and their lack of understanding of how OCs work. In addition, when the Harris Poll (Taylor et al., 1994) asked women "how likely is it that they would buy the pill without a prescription if insurance or government subsidy did not cover it" women more frequently said "yes" to the question than in the earlier poll. The percentage of women responding to this question in positive was greater for pill users than for nonpill users. In the same survey, more women thought that they would buy OCs over-the-counter even if they were more expensive as long as OCs did not require a prescription. While this question did not relate to the safety aspects of oral contraceptives, it did indicate increased confidence on the part of women to use OCs if they were in fact available over-the-counter.

Notwithstanding the conflicting findings and methodological inadequacies of these surveys, the emerging mixed attitude among women about obtaining oral contraceptives from different sources is an issue for further investigation. Understanding how women make decisions about acquiring oral contraceptives is important for designing programs and health services to assist in preventing unwanted pregnancies and family planning. Changes in the status quo should take into account the views of women regarding the change, including their preference for and any perceived need for that change. The promotion of more effective means of providing OCs is an important public health issue. Thus it is important to study women's attitudes toward various means of access to oral contraceptives.

There is little research done today in areas of consumer perceptions of the need for and the safety of nonprescription products. Therefore, there is a need not only to assess any consumer preference for unrestricted access to nonprescription OCs, but also to identify and research factors that might actually determine any preference they may have for different sources of pills available to them. In the current socio-political atmosphere, which recognizes the need to strengthen and promote research related to women's reproductive health care--a component of which also involves provision and acquisition of OCs--there exists a knowledge gap about issues of access and barriers to oral contraception. Therefore, it is the purpose of this study to address questions related to the preference for the prescription requirement for oral contraceptives and any preference for an alternative system in which to obtain OCs, and to identify factors relating to their stated preference. Broadly, the objective of the study is to seek answers to the following inquiries:

1. Given a new means of acquiring OCs, what factors differentiate women who express a preference for a system in which OCs could be acquired over-the-counter, from other women who do not express a preference for such a system?
2. What are the factors that underlie a woman's stated intention to acquire OCs over-the-counter? In what ways are the expressed beliefs different for different women regarding their choice of acquiring OCs over-the-counter?
3. Do women's beliefs about the acquisition of OCs correlate with attitudes about acquiring them? That is, are beliefs about the positive (negative) aspects of OC acquisition in a particular way correlated with the corresponding favorable (unfavorable) attitudes?

Significance of the Study

One of the important issues in social psychology research relates to whether beliefs about objects, person, institutions, or events explain (or correlate with) a person's attitudes toward the same. Traditionally, this line of research has also investigated the role of attitude in influencing the performance of ultimate behavior. In the current context of OC acquisition, however, the relationship between beliefs and attitudes regarding the acquisition of OCs OTC is not clearly understood. It is not known whether beliefs held by women about the acquisition of oral contraceptives help shape their attitudes toward acquiring them. Would the attitudes toward acquiring OCs--favorable or unfavorable--explain any preference women might have for acquiring oral contraceptives in a particular way? Would the beliefs held by women regarding the use and the choice of means for acquiring OCs relate to their intention to acquire them in a particular way? Are behavioral beliefs predictive of behavioral intentions? The current investigation

seeks to address these questions. Are women's intentions to acquire OCs with or without a prescription predicted by their beliefs and attitudes? This study aims to investigate this issue further and explain any preference for acquiring OCs as a function of intention to acquire them at a future time. The study's important contribution lies in the fact that it provides an improved understanding of the relationship between OC beliefs, attitudes, intentions, and preferences. Such a relationship has not been explored in depth in the literature pertaining to reproductive health.

Besides theoretical ramifications, the study also has many practical implications. The ways in which contraceptives are obtained and used in this country are of immense interest to researchers, clinicians, and policy makers. Any policy directed at improving women's reproductive health care has far-reaching social, economic, and psychological consequences. For many years in the United States, oral contraceptives have been made available to women only under a physician's authority, whereas their counterparts in other countries have acquired them without any restriction. The socio-economic conditions and people's religious, political, and moral preferences, however, distinguish people in the US from those in other countries. Policy makers, in deciding whether or not to switch oral contraceptives from prescription to non-prescription status, will do well to examine women's beliefs and preferences regarding any changes. The significance of the study lies in the fact that the proposed switch of birth control pills to over-the-counter category not only seeks to improve women's reproductive health care, but also has implications for a rampant social problem in the US--teenage pregnancy.

CHAPTER 2 REVIEW OF LITERATURE

Introduction

This chapter is divided into two major sections. The first section is a brief introduction to the history behind the development of oral contraceptives and public perceptions regarding their use. Issues about safety, efficacy, and costs of using OCs when they are used with or without a physician's prescription are discussed in this section. This section also deals with issues related to Rx-to-OTC switches of oral contraceptives, including the social and economic ramifications of such a switch. Arguments in favor of or against switching birth control pills to an over-the-counter category are also reviewed in this section. The second section is devoted largely to the attitudes of women towards contraception in general and oral contraception in particular. The attitude theories relating to the use of contraceptives, including OCs, will be the major focus of this section. A brief introduction to the theory of reasoned action, a theoretical framework used for this study, will also be provided in this section.

Oral Contraceptives--Overview

History

The introduction of oral contraceptives in 1960 was a major medical achievement that changed approaches to family planning all over the world. Dr. Gregory Pincus and

his colleagues developed the oral contraceptive pill in 1960 for Planned Parenthood Federation. The OCs initially contained estrogen and progestin synthetic hormones, and worked primarily by suppressing the release of eggs from a woman's ovaries. These pills contained as much as 100 to 150 micrograms of estrogen and as much as 10 milligrams of progestin, a level high enough to cause some unwanted side effects. Since that time the level of estrogens in oral contraceptives has dropped steadily to a point where they are now considered by many to be safe enough to be moved over-the-counter (OTC). Although the oral contraceptive pill was widely accepted, concerns about its serious side effects started arising in the early '60s. Women from different countries reported blood clotting and stroke (Snider, 1990). Following ongoing research on side effects of OCs, it was concluded that high levels of estrogen were indeed linked to increased incidence of blood clots and heart attack. Subsequently, low-dose estrogen oral contraceptive pills were introduced into the market in the US. Contemporary oral contraceptives are considerably safer as they contain less estrogen and progestin. The risks of side effects are believed to have decreased for healthy, non-smoking women (Grimes, 1992).

One of the major uncertainties about OCs is their potential to cause breast, cervical, ovarian, and endometrial cancer (Grimes, 1992; Gross et al., 1992; Thomas, 1991). While there are conflicting results among studies, a comprehensive review of oral contraceptive use and its possible link to different types of cancer has been published by the National Cancer Institute (Fact Sheet, June, 1985). Some experts contend that all the data available today reflect the effects of older, higher-dose pills and not the newer low-dose pills currently available in the market. In fact, birth control pills are even believed to have some beneficial health effects (Grimes, 1992; Gross et al., 1992). Numerous

studies show that OCs protect women from incidence of some ovarian and endometrial cancers, benign cysts of the ovaries and breasts, and pelvic inflammatory diseases (Grimes, 1992; Gross et al., 1992; Thomas, 1991). They are also believed to prevent heavy and irregular menstrual periods and a certain type of anemia (Grimes, 1992). Some would even argue that the risk of getting cancer from OCs is so small that benefits of taking them far outweigh the risks associated with their use (Trussell et al., 1993; Peterson and Lee, 1989). A few studies are currently under way to detect a link between cancer and OC use to see if such a link exists.

In any case, the oral contraceptives are not deemed safe for all women. Certain subgroups of women are at risk of serious illness and death if they use oral contraceptives. For instance, women who smoke, particularly those who are over 35, are at significantly increased risk of heart attack and stroke (Snider, 1990; Grimes, 1992). Women who are obese or having health problems such as diabetes, hypertension, or high cholesterol are often advised against using OCs. In addition, OCs are contraindicated in women with history of clots, stroke, heart disease, liver disease, or cancer of the breast or sex organs. Over the years, there have been more studies conducted on OCs to look for their serious side effects than any other medicine in history. However, misconceptions regarding the known and unknown effects of OCs continue mainly because of conflicting results from available studies. In one review, Peterson and Lee (1989) argue that the public misconceptions and controversies about OCs are mainly due to the failure in the efforts of health educators, health care providers, and the lay press. This assertion by the authors has been untested to date. They contend that legitimate disagreement among investigators regarding interpretation of data has also contributed to the confusion. This

assertion is particularly important in view of the current development in oral contraception research, which is advocating a "new" status for oral contraceptives. There is some further evidence of such misconception about the use of oral contraceptives in reproductive literature (Stenson, 1996).

In summary, it is not known whether the misconceptions referred to above contribute to the perceptions of risk among OC users. It is also not known if such perceptions change if OCs are bought and used under the circumstances that might actually alter the level of risks associated with their use. For example, the misconception that OCs cause cancer might mean lack of preference to acquire them with no medical supervision. Perceptions of risks of using OCs, either as a result of personal experience with them or as a result of misconceptions held about their use, are currently not well understood. The literature describing this issue is sparse, further emphasizing the need to conduct more research in this area.

Rx-to-OTC Switch and a Possible OTC Status for Oral Contraceptives

The FDA's OTC Review provided a major impetus for switching drugs from prescription to OTC in 1972. Following the Durham-Humphrey Amendment to the Federal Food, Drug, and Cosmetic Act of 1951 (Ch 578,65 Stat.648), prescription drugs were defined primarily as those unsafe for use except under professional supervision. Some of the major considerations in deciding whether or not a drug should be available without a prescription were its toxicity, its safety, and whether conditions for taking the drug are self-diagnosable conditions (Hayes, 1990; Rheinstein, 1985; Botstein, 1990; Wion, 1985). In reviewing switching, certain changes to the product labels and inserts

were made in order for the patient to understand the information clearly and easily (Hayes, 1990; Rheinstein, 1985; Botstein, 1990; Wion, 1985). Nonprescription drugs were thus deemed safe as long as consumers were able to follow directions and warnings on the label. The OTC-Review in 1972 made it possible to switch prescription drugs to nonprescription status and over 400 previous prescription-only ingredients have gone over-the-counter since then. The Nonprescription Drug Manufacturers Association estimates that more than 200 OTC drug products on the market today were available by prescription only a decade ago (Segal, 1991). Nine out of the 10 top selling drugs today are OTC products that were prescription-only not long ago. The FDA has reclassified antihistamines, nasal decongestants, sleep aids, pain relievers, cough medicines and antifungals among other therapeutic classes. It has been projected that OTC drug market would reach \$28 billion in manufacturer sales by the year 2010. (Laskoski, 1992).

Pros and Cons of Switching OCs to Over-The-Counter

The possible switch of OCs to the non-legend category was suggested recently, amidst rising controversy, only to be postponed for later consideration (The Tan Sheet, March 29, 1993). The controversy over the matter related primarily to the safety of using OCs without medical supervision. The safety concerns mainly related to the possible adverse effects of using oral contraceptives without medical authority, and the possible risks of incidence of cancer. As pointed out earlier, the results from the national polls conducted during this and the last decade (Gallup Poll, 1985, 1994; Taylor et al., 1994) seem to support the controversy. In addition, our preliminary exploratory, qualitative study also supported the concern voiced by women during the previous polls. This study

(Nayak et al., 1994) involved 6 women attending the University of Florida Student Health Care Center, who expressed interest in learning about OTC oral contraceptives. Information from the participating subjects about their perceptions of safety of OCs was elicited through a face-to-face interview. Information about their preferences for acquiring oral contraceptives over-the-counter was also gathered. It was found that women were divided in their preferences for obtaining oral contraceptives from alternative sources. While some women preferred a more traditional, prescription-only method, some women indicated preference for an OTC oral contraceptive pill. The women, who indicated a preference for acquiring OCs under a physician's authority often cited safety concerns, particularly drug side effects. However, those who favored OTC oral contraceptives cited cost and convenience as being important considerations in their choice for acquiring OCs.

In most countries, including the USA, women are required to obtain a physician's prescription before they can use oral contraceptives, and they can usually buy them only from local pharmacies (see Paxman, 1980, Coeytaux and Allina, 1994, for review). A single argument in favor of deregulation of oral contraception has been that the prescription requirement for OCs made them geographically, economically, and sometimes culturally inaccessible to many women. In the United Kingdom, for example, it was argued that midwives, health care professionals, and even social workers could oversee the distribution of OCs (Anonymous, 1974). However, in the UK context, the possibility of making OCs available OTC was not entirely ruled out as long as it could be established that the currently used OCs containing less than 50 micrograms of estrogen were significantly safer than and as effective as the 50 microgram pill. In the USA, the

legacy of the Comstock Act of 1873, which made it a criminal offence to import, mail, or transport in interstate commerce any literature about birth control or any device designed to prevent conception or cause abortion, continued to medicalize the status of OCs.

Following the proposal for a change in New Zealand (Campbell et al., 1996) and the UK, and changes already in effect in countries such as India, South Africa, and some South American countries (see Coeytaux and Allina, 1994), similar proposals to give OTC status to OCs have recently gained momentum in the United States (The Tan Sheet, March 29, 1993). It appears that the concerns of the manufacturers and the prescribers in the US are very different. While manufacturers are concerned about the possible product liability lawsuits, physicians are skeptical about patient compliance with OTC pills, not to mention the foregone income from patient visits (Conkling, 1993, Goldstuck et al., 1987; Oakley et al., 1991). Increased profit motives on the part of family planning clinics may also be contributing largely to the current prescription status for OCs (Trussell et al., 1993). Thus, there seems to be a complete lack of consensus among health care professionals and others regarding the appropriate status for pills. Recently, a major proponent of the switch has even gone on record by reversing his position on the issue. (See editorial: Grimes, 1995). However, the above findings do suggest that while the positions of researchers and policy makers regarding the status for OCs are known (as researchers do not all have a similar position in this issue), we do not yet completely know the opinions of the ultimate users of OCs.

The evidence reviewed above suggests that women's beliefs about the purported status for OCs hinge mainly on their perceptions of risk associated with their use. A woman's perception of risk in this case may be broadly classified as one of two types.

The first type of risk is an inherent risk of minor and serious side effects of the drug itself, regardless of the type/level of supervision--regarded as direct effects of the drug. The second type of risk--termed indirect risk--relates to the therapeutic failure as a result of inadequate or lack of professional oversight and general health risks associated with foregoing certain preventive health services.

The first type of risk, the risk of side effects, stroke, and cancer, has been already discussed in detail. The second type of perceived risk is often the result of imperfect use of OCs without proper clinical counseling. This type of risk relates to the indirect effects of using OCs acquired possibly from alternative sources. Examples of indirect effects include possible noncompliance with oral contraceptives (an efficacy issue) and loss of health screening. In a review article, Trussell and his coauthors (1993) argue that safety considerations, either from the biomedical aspects of OC use or from the standpoint of health risks accruing from foregoing preventive health services, do not justify prescription status for oral contraceptives. As for the efficacy of OCs, they contend that efficacy among perfect users will not be affected by prescription status. The level of noncompliance with OCs, often cited as an argument against switching OCs to the nonprescription status, is also believed to vary depending on the way they are acquired. These researchers argue that the type and extent of imperfect use determine the compliance with OCs during typical use. Imperfect use, they contend, may include missing pills and failure to use a backup method of contraception if pills are missed, if antibiotics or anticonvulsants are taken, or if vomiting or severe diarrhea occurs. They believe that the missed pill noncompliance, although a serious and a common problem, and the subsequent risk of pregnancy may be effectively minimized by proper counseling

and monitoring provided routinely by the health personnel. Trussell and his colleagues (1993) also cite instances of missed pill noncompliance even among women who visit clinics regularly to obtain birth control pills. They assert that improper use of OCs is widespread despite the current prescription requirement (see Oakley, 1994; Oakley et al., 1991; Potter, 1991).

An indirect component of this risk, the general health risk, stems from women's foregoing certain preventive health services and screening for cancer. The status quo requires that women submit themselves to certain preventive health services like pelvic examination and pap smears to screen for cancer, even though the health conditions they are screened for are unrelated to decisions about oral contraception. A part of this attendant service is also the testing for sexually transmitted disease (STDs). The idea that OCs may be available through other unregulated channels may mean foregoing such tests and exposing oneself to higher levels of risk - a risk to oneself and a risk to the society as well. Some experts view contraceptive prescription as being held hostage to such unrelated preventive services and argue in favor of conducting such examination separately from the prescription for oral contraceptives (Grimes, 1993; Trussell et al., 1993; Waldron 1990). In light of the current opinion that such examinations should either be deferred or held independent of the oral contraceptive prescription, the FDA has moved recently to recommend physical examination to be delayed before a physician prescribes oral contraceptives (The Blue Sheet, May 26, 1993).

Arguments in favor of OTC status, for drugs in general, also include cost savings, convenience, choice of providers, and the availability of free information and advice. Typically, drugs cost less as nonprescription than prescription medicines, although

initially the nonprescription cost may be higher than the prescription price (Schondelmeyer and Johnson, 1994; Trussell et al., 1993). Temin (1992) studied the costs and benefits of switching cough-and-cold medicines in the United States and found that visits to doctors for common colds fell by 110,000 per year (from 4.4 million) from 1976 to 1989. This trend mainly coincided with the switching of medicines. Among the factors that he considered and rejected as possible explanations were decreased number of potential patients, a general decrease in visits to physicians, and a relative increase in the cost of visits to physicians. Having ruled out other possibilities, he concluded that the decrease in physician visits was attributable to the switching of these drugs (1983). His estimate of the overall saving to the population was \$70 million per year.

Regarding the costs associated with the acquisition of OCs, a major drawback of the prescription requirement for OCs is the cost of obtaining them. Included in the overall cost are the price of the drug, cost of physician visits, cost of time lost from work, and the cost of prescription refills that require repeated consultation with the physician. Assuming that low-dose OCs are safe enough to buy OTC, the issues of self-diagnosis and dosing adjustments to meet patient needs are currently being debated widely in the health care community. However, making OCs available OTC is believed to present some obstacles for certain women. Some fear that poor women who obtain OCs inexpensively, say, from family planning clinics, may now pay higher prices because of the possible discontinuation of price discounts by companies to these clinics. While some women depend on Planned Parenthood and family planning clinics to get their OCs free of cost, some worry that insurance policies that covered prescription drugs may no longer pay for OCs (Trussell et al., 1993; Nayak et al., 1994). Thus tied to the cost of the

OC is lack of insurance coverage. Women who are covered under the Medicaid prescription drug program are likely to favor the status quo as it substantially reduces out-of-pocket cost to the recipient. There is very limited information currently available describing the cost-related issues involved in the acquisition of oral contraceptives in the US. The available evidence, however, indicates substantial cost savings for most women if they were to acquire OCs with no prescription from a physician.

As noted by Trussell et al.(1993), above all the arguments, the strongest one in favor of a nonprescription status for OCs is its purported role in minimizing unplanned and unwanted pregnancies, especially among teenagers. Increased adolescent sexual activity, mainly in the past decade, has resulted in a sharp increase in the rate of pregnancy, childbirth, abortion, and even increased incidence of STDs in the US. The Gallup Poll (1994) reported that 84% of the women polled were not aware that OCs posed fewer risks than childbirth in women aged 55 and under. Removing barriers to the availability of OCs, therefore, is expected not only to dispel the misconception about their use, but actually help prevent unplanned and unwanted pregnancies. Also a lesser known fact about OCs is their effective use as post-coital contraceptives (Trussell et al., 1992; Owen, 1993). Recently, the FDA has endorsed the use of OCs as postcoital contraceptives (The Pink Sheet, March 3, 1997; The Green Sheet, July 8, 1996). Experts believe that only the increased availability of pills through sources other than a physician will remove any barrier to their widespread use (Trussell et al., 1993). A review by a team of experts contends that if postcoital hormonal treatment were widely available, the number of unintended pregnancy in the United States could fall by 1.7 million each year, and the number of abortions could be reduced by 800,000 annually (Trussell et al., 1992).

Although few women and even doctors know of this option, the possible sale of OCs through unrestricted channels will no doubt be of benefit to those women who wish to use them as morning-after pills, in addition to those who use them for regular contraception.

As a solution to the problems discussed in the preceding section, the proponents of change have made some suggestions of change to the current system. Recommendations include labeling changes, revision of patient package inserts (PPI), and provision of new options that include, among other things, sale of OCs through pharmacies, telephone authorization from nurses, installation of toll-free helplines for consultation, and acquisition of OCs by answering self-administered questionnaires that screen women for contraindications (Trussell et al, 1993).

Contraceptive Beliefs, Attitudes, and Behavior (practice)

The literature is replete with research that shows the effects of demographic variables, such as socio-economic status, education, religion, age, race, etc. on effective contraceptive use. Typically, women of higher status and better education are believed to be effective contraceptors, even if there exists no trend data to examine the effects of these variables over a period of time. While a few studies have investigated the influence of access on contraceptive practice (Hanna, 1994; Eisen et al., 1985), there is a lack of information about the role of access to contraception in determining the choices women make about their birth control options. Unlike in other countries where access to contraception has always been a major problem, in the United States, the issues of access have been discussed only in relation to hormonal contraceptives and devices. Therefore,

it is not known if a woman's access to contraception, such as family planning services, will actually determine her preference for a particular method of contraception. Evidence also suggests that despite the widespread availability of contraception, a large proportion of sexually active adolescents have failed to use contraception effectively (Durant et al., 1984; Scher et al., 1982). It is also not known if any barrier to access to contraception or related services might be responsible for such a failure. Due to the limited predictive ability of a contextual variable like access, the research on contraceptive attitudes and beliefs appears to have focused instead largely on numerous aspects of sexuality, pregnancy, and family structure. In order to explain contraceptive practice, recently researchers have focused their attention increasingly to psychological variables like sense of control, self-esteem, and self-efficacy. In addition, the researchers, recognizing reproductive behavior and contraception use as being a joint enterprise, have begun to explore interpersonal interactions, such as those between man and woman, and physician and patient (Weisman et al., 1991; Oakley, 1994; Keller, 1996.). Interestingly, some major studies carried out in the United States, each employing the now familiar KAP (knowledge, attitude, practice) model, have failed to establish any significant relationship between psychological variables and contraceptive practice.

The majority of the studies reviewed here has concentrated on adherence to contraceptive regimen and compliance with contraceptive therapy among sexually active female adolescents. These studies indicate that the level of adherence in female adolescents was largely influenced by their contraceptive perceptions. The findings relating to attitude regarding contraception have generally been consistent. Most of the studies, however, are based on college student samples. It is possible that selection

variables related to university environment result in sample biases that could substantially affect research results. For the same reason, the generalizability of these studies may also be limited. The research on women's perceptions about oral contraception in particular has focused largely on benefits and detriments of using OCs (Weisman et al., 1991; Werner and Middlestadt, 1979; Herold and Goodwin, 1980). However, only a small number of such studies that incorporate psychological variables within their framework have been published recently (Durant et al., 1984).

A few studies have also examined the role of locus of control in contraceptive behavior (Herold et al., 1979; Visher, 1986; Blignault and Brown, 1979). Several studies describing women's attitudes about the benefits and barriers of contraception in general have also been discussed in the literature. Among attitudes expressed, besides clear contraceptive benefits such as preventing pregnancy (Eisen et al., 1985; Kalmuss et al., 1987; Scott et al. 1988), and demonstration of responsibility (Eisen et al., 1985; Kalmuss et al., 1987), having control over one's own life (Kalmuss et al., 1987) appears to be an important variable determining contraceptive attitude. In addition to benefits, women are also reported to perceive barriers to contraception. Some personal barriers include negative perceptions about possible harmful health effects, (Eisen et al., 1985; Kalmuss et al., 1987; Luker, 1975; Scott et al., 1988), perception that they are difficult to obtain and use (Eisen et al., 1985; Luker, 1975), that they involve planning for sexual activity (Eisen et al., 1985; Luker, 1975), that they are against religious beliefs (Eisen et al., 1985), that they may be expensive (Luker, 1975), are embarrassing (Eisen et al., 1985), and are ineffective (Kalmuss et al., 1987). There are other perceived barriers to contraception which included parental disapproval and partner factors (Luker, 1975).

While some of these studies examined the role of contraception in general, a few also looked at the barriers in the use of oral contraceptives. While it can be argued that some of the barriers and benefits related to different forms of contraception apply also to oral contraception, no conclusive evidence is available to support this argument at this time. More research is warranted to identify such perceived benefits and barriers among oral contraceptive users.

Kathleen (1994) reported an oral contraceptive study that sought to somewhat address the knowledge gap mentioned above. This study described 12 female adolescents' oral contraceptive perceptions that were considered independently and then after facilitation by a nurse. Oral contraceptive perceptions were measured through the use of a decision balance sheet and a structured interview, each eliciting 44 and 31 descriptions respectively. The content analysis of the data indicated that the majority of the participants perceived OC benefits related to pregnancy prevention and others' approval and barriers related to side effects and others' disapproval. Even though this study fails to describe the term "facilitation" in the context of the study, it supports the findings of the earlier studies (Eisen et al., 1985; Luker, 1975) about perceived benefits and barriers to contraception. The structured interview part of this study is noteworthy in that it reveals preference on the part of some participants to seek autonomy and what was described as self-approval in oral contraceptive use. This finding also partly confirms previous results regarding subjects' wish to gain more control over their lives (Kalmuss et al., 1987). Thus, the review presented here indicates that there is substantial literature relating to the influence of psychological factors on contraceptive practices in general.

However, the literature pertaining to a similar influence on the use of oral contraceptives is scarce and sketchy.

Forman et al. (1997) reported an OC study that determined female college students' attitude toward over-the-counter availability of oral contraceptives. A survey containing 28 items to assess beliefs of young women about OC acquisition OTC was administered to 290 female undergraduate students at an urban women's liberal arts college in Boston, Massachusetts. The investigators sought to determine students' beliefs about OC availability and examine factors associated with these beliefs. A dichotomous question was asked of these students assessing whether or not they believed that OCs should be available without a prescription.

Students who believed that OCs should be available OTC were asked to rank three reasons for this belief from a list of 11 choices. Those who did not believe that OCs should be available OTC were asked to rank three reasons from a list of nine choices. The results of the study indicated that 65 percent of women who responded to the survey felt that OCs should not be available without a prescription. Women cited two reasons frequently for not wanting to buy OCs without a prescription. They were: (1) physiological side effects that could have been prevented by a health care provider (59%), and (2) women would not go to their providers for regular checkups (56%). The most commonly cited reason for wanting OTC availability of oral contraceptives was that there would be fewer unwanted pregnancies (74%). Further, logistic regression performed by the authors revealed that both younger age and previous pregnancy were the important factors that related to the beliefs about acquiring OCs over-the-counter.

While the majority of the women in the study felt that OCs should not be available OTC, this study had several limitations. First, the study design used convenience sampling method to approach their subjects. Second, the overall response rate to the survey was low at about 29 percent. The study provided no scientific evidence regarding the reliability and validity of the instrument that was used in the study. Finally, the investigation lacked a sound theoretical framework to base its conclusions on. Thus, while the conclusions made by the authors were important from the standpoint of OC availability OTC, the generalizability of the study results to other populations is questionable. However, this is the only empirical research on the issue of OTC availability of OCs that is known to the author of this manuscript and is thought to be very relevant to the current investigation.

Attitude Theories Applied to Contraceptive Practices

The attitude theories are considered to be a part of a larger family of cognitive, individual choice models, which together are usually referred to as expectancy-value models. The prediction and explanation of human behavior rests on the assumption that people make a reasoned choice of behavior to enact based on instrumentalities, valences and expectancies associated with the behavior (Kanfer, 1990). Several social-psychological models have been used in the past for the prediction of contraceptive behavior. The history of attitude-behavior consistency in the area of contraceptive practice is believed to parallel closely the developments in the theoretical literature on consistency.

Early studies done in the area of attitude-behavior relationship have generally demonstrated a weak relationship between these variables. According to Fishbein (1975), the relative neglect of the relationship between attitude and behavior could be in large part attributed to the widespread acceptance of the assumption that there is a close correspondence between the ways in which a person behaves toward some object and his beliefs, feelings, and intentions with respect to that object (p.336). Traditionally, however, given the way in which the term attitude was defined (as a learned predisposition to respond to an object in a consistently favorable or unfavorable manner), the view among researchers has been that there is a strong link between attitude and behavior. Further, this traditional view also held that any stimulus object came to elicit an attitude which mediated or determined all responses to the object. According to this view, any response could be used to infer a person's attitude. As an explanation to the weak attitude-behavior relationship, however, Wicker (1969) noted in his review of 42 studies that "taken as a whole, these studies suggest that it is considerably more likely that attitudes will be unrelated or only slightly related to behaviors than attitudes will be closely related to action" (p.65). More recently, there have been attempts to specify variables that moderate the attitude-behavior relationship and to identify those situations under which attitudes will predict behavior. For example, Fishbein and Jaccard (1973) studied the situation and personal factors that render motivational (and, hence, attitudinal) variables irrelevant to behavioral prediction. It is against this backdrop that we will examine studies that investigated attitude-behavior relationship in the area of reproductive behavior in general and contraception in particular.

Methodological Considerations

Wicker (1969), in his review of 42 studies obtained an average attitude-behavior correlation of approximately 0.15 for these studies. Similarly, the investigations aimed at contraceptive behavior and attitudes, and those that studied family planning behavior have typically reported weak attitude-behavior relationship (for reviews, see Mauldin, 1965; Werner, 1977). Mauldin (1965) states, following his review of some of the KAP (Knowledge, Attitude, Practice) studies pertaining to family planning behaviors, "we know in a general way that verbal and non-verbal behavior often are not closely correlated (p.98). According to Werner (1977), the reason for a weak relationship between attitudes and behavior was that the measurements techniques used were faulty. He recommends that more attention be devoted to improving measurement procedures in family planning research or programs. Methodologically speaking, Davidson and Morrisson (1983) argue that the majority of the studies involving contraceptive behavior were conducted using across-subject designs. They demonstrate in their study (1983) that within-subject models indeed provided a more adequate explanation of behavior from attitudinal constructs, and hence more accurate prediction of behavior from attitudes than did the across-subjects models. They argued that the difference in prediction reflected an important distinction between the two approaches in their orientation to behavioral prediction. According to them, in the across-subjects approach, what a person does is best described in comparison to what others do, whereas from the within-subjects perspective, what a person does is best described in comparison to what the person could have done but did not do.

Across-subjects approach has been the common approach used by the majority of the studies reviewed here. These studies have reported somewhat weak attitude-behavior correlations, while leaving considerable room for improvement. For example, even when specific measures of attitudes were employed, the attitude-behavior relationship was found to be weak, as reported in some of the studies above. This situation has led to the development of theories that included variables other than attitude in the prediction of behavioral intention or behavior. Fishbein and Ajzen (1975), for example, suggested that norms might also influence a person's decision to perform a behavior. They called their framework the Theory of Reasoned Action, which is one of the most widely tested theories in social psychology (Fishbein and Ajzen 1975). This theory proposes that an individual's attitude toward a behavior and his subjective norm expectations of appropriate behavior are the immediate determinants of his behavioral intention, which precedes behavior. There is a substantial body of research that has examined the role of attitudes in the prediction of contraceptive behavior, family planning behavior, etc using the Theory of Reasoned Action (See Jaccard and Davidson, 1972; Adler et al., 1990). The results of these studies have generally supported the utility of this model in understanding the reproductive behavior.

Methodologically speaking, Davidson and Morrison (1983) point to a deficiency in traditional research. Traditional research, in their opinion, has relied heavily upon the prediction of behavior based on the (a) the actor's attitude toward performing the behavior, (b) the attitudes of other respondents toward performing the behavior, and (c) relative attitudinal intensity among the respondents. This also seems to be the approach adopted by a majority of the studies that examined various reproductive behaviors

(Kothandapani, 1971; Jaccard and Davdison, 1972; Werner and Middlestadt; 1979).

These studies, involving mostly across-subjects approach, have held that individuals most likely performed the behavior when they possessed positive attitudes toward performing that behavior. In contrast, the approach used by Davidson and Morrison (1983) adds another variable to the earlier model--a person's attitude toward alternative or competing behavior and the relative intensity of these attitudes. Thus, the inclusion of a competing behavioral alternative seemed to add to the correspondence between the behavior and attitudes.

A methodological drawback in a majority of the studies reporting weak attitude-behavior relationship was that the instruments used to measure attitudes and behavior often did not take into account the multidimensional nature of attitudes, including cognitive, conative, and affective components. Thus, single attitude scores could not adequately represent all of these attitudinal components and thus could not predict behavior accurately. Ajzen and Fishbein (1973) point out that the traditional measures of attitudes, while relevant to the prediction of behavior, are insufficient. Further, they contend that most treatments of attitudes have not dealt systematically with additional variables (such as personality characteristics, social norms, habits etc.) as determinants of behavior. Instead, they argue that researchers have viewed these other variables as sources of error variance. Further stressing this point, to explain the low attitude-behavior relationship, particularly with respect to the fertility related behaviors, Fishbein and Jaccard (1973) contend that the investigators have been unable to recognize the role non-demographic factors. To resolve this issue, Fishbein (1972) has proposed an intention-based model to account for 'nonattitudinal' factors. In this model, the intention

to perform a behavior was proposed to mediate the relationship between attitudes and behavior. In addition, another component--called subjective norm--represented a social or normative influence on social behavior. Thus, it appears that, in order to obtain a substantial attitude-behavior relationship, one needs to take into account variables that are not strictly attitudinal in nature.

Experts (Fishbein, 1972; Davidson and Jaccard; 1975) argue that most of the large-scale studies have not been based on any underlying or organizing theory. Instead, such studies are restricted to the testing of a "large number of interesting, but often unrelated hypotheses." Therefore, it is perhaps possible to achieve larger magnitude of relationship between attitude and behavior if one formulates a body of theory to guide the research.

As pointed out earlier, a concern with regard to the attitude-behavior research in the area of reproductive behavior was that very few studies actually examined the influence of variables that moderated the relationship between attitudes and behavior. For example, personality variables, prior behavioral experience (Regan and Fazio, 1977; Bentler and Speckart, 1979), including level of moral reasoning (Gorusch and Ortberg, 1983; Schwartz and Tessler; 1972) have been shown to influence the magnitude of the attitude-behavior relations in studies investigating nonreproductive behaviors. Such studies are, however, rare in the reproductive social psychology domain. A majority of the studies seems to work under the assumption that there is a direct relationship between attitudes and behavior, ignoring the role for external variables. There is no systematic research conducted to define the role of these "other" variables in influencing attitude-behavior relationship. For example, it is not known whether these variables moderate the

attitude-behavior relationship or they influence the relationship in other manner (e.g., as antecedent variables), particularly in the area of reproductive behavior research.

In partial agreement with Wicker's (1969) conclusion, Fishbein and Ajzen (1974) show that the low values are typically obtained for correlations between general attitudes (e.g., attitude toward religion) and individual behaviors (e.g., particular religious behavior such as praying before meals). These researchers, through aggregation analysis (1974), demonstrate that simply aggregating behaviors can substantially increase the correspondence between these variables. Behaviors that are aggregated establish a measure of behavior that corresponds in generality to the attitudes that are assessed. Thus, by designing multiple-act criterion which aggregates behavior over an appropriate sample of differing acts carried out in varying contexts and on differing occasions, one could actually produce relatively high correlations between an attitude and behavior (1974). However, a good majority of the studies dealing with contraceptive behavior--both prior to and after Fishbein and Ajzen's aggregation analysis--seem to have adopted single-act criterion, thus further contributing to a low attitude-behavior correspondence.

Pagel and Davidson (1984) made an effort to further evaluate attitude-behavior correspondence employing a comparison of multiple attitude models. These investigators compared the predictive validities of three prominent social psychological models of attitude and behavioral decisions, applied to contraceptive behavior. They compared Rosenberg's (1956) instrumentality-value model, Fishbein's (1963, 1967) belief-evaluation model, and Beach's adaptation model of the subjective expected utility (SEU) model (Beach et al., 1979) in the prediction of contraceptive behavior. The components of each of the models were rated by a sample of 70 female undergraduates and their

attitudes and behavioral plans toward using three different contraceptive methods were assessed. The authors reported that each of the expectancy-value models significantly predicted subjects' attitudes and behavioral plans.

There is a large body of research reported on attitude-behavior relationships, primarily in the area of contraceptive alternatives, family planning etc. (Cohen et al., 1978, Davidson and Jaccard, 1975; Jaccard and Davidson, 1972, 1979; Kothandapani, 1971). The literature is also replete with work on the attitude-behavior relationship with respect to condom use and contraceptive utilization. However, the studies on attitude-behavior consistency concerning the use of OCs are reported less frequently in the literature.

Further examination of the studies from the methodological standpoint reveal that, while a majority of the studies seemed to employ adequate sample sizes, some did not utilize adequate numbers of subjects (Ajzen and Fishbein, 1972; Werner and Middlestadt; 1979), thus diminishing the power. Depending on the type of research design and conceptual frameworks used, a large number of studies used correlational statistics, including multiple regression, bivariate correlations etc. In any case, certain observations are in order regarding the procedures used in many studies involving the measurement of contraceptive behavior. First, a good number of studies using Fishbein's behavioral intention model reported the prediction of behavioral intention from attitudes rather than using the actual overt behavior itself as a criterion. Some of the studies assessed self-reported, retrospective reports of behavior in the same session in which attitudes were measured. As a consequence, a desire on the part of respondents to appear consistent or a tendency to infer their attitudes from their reported behavior might have

contributed to the relatively successful predictions that were obtained. A majority of the studies examined attitudes toward single behaviors, using a large variety of theoretical frameworks available at the time. Also, a good number of studies reported reliability and validity estimates but a few studies failed to report these values (Ajzen and Fishbein, 1969; Davidson and Jaccard; 1979). The reliability and validity issues were adequately addressed in some studies through item analysis and such, especially when self-report attitude scales were constructed. However, those studies involving behavioral observation seemed to fall short of reporting good reliability estimates. Finally, as should be expected, a large number of studies utilized a fairly homogeneous sample of female respondents, particularly college students or adolescents. Therefore, generalizability of these studies to a larger population may be questionable.

Influence of Beliefs, Attitudes on Intentions and Use

The earlier literature in social psychology makes no clear distinction between intention and attitude. Fishbein and Ajzen (1975; p.288) defined intention as a person's location on a subjective probability dimension involving a relation between himself and some action. A behavioral intention, therefore, referred to a person's subjective probability that he will perform some behavior. Fishbein and Ajzen (1975) point out that the more favorable a person's attitude toward some object, the more he will intend to perform positive behaviors (and the less he will intend to perform negative behaviors) with respect to the object. However, they contend that when attitudes and intentions are measured at different levels of target specificity, a high correlation is usually not

obtained. As the measure of intention becomes more specific (in terms of the behavior, situation, or time), its relation to attitude will tend to increase.

Currently, little is known about how women's beliefs about contraceptive methods relate to either their intention to use them or their actual use. It is not known if women's intentions and actual use of OCs is affected by the relative desirability of available alternatives. Women who prefer other methods of contraception may have weaker intentions or be less likely to use the pill, even if they hold positive beliefs about their effectiveness. Consequently, it appears that beliefs alone about OC effectiveness are not sufficient to affect behavior. Instead, intentions to use OCs may also be related to other factors of OC use, such as cost, interpersonal consequences of their use, or social factors.

Providing insights into the possible relationship between belief and intention, a study by Moore et al. (1996) reported that female adolescents' beliefs about the contraceptive pill were predictive of their initial intentions to use the pill and their actual pill use over the course of a year. This study used a sample of 345 adolescents attending an adolescent health care clinic in the San Francisco area. These adolescents were interviewed about their beliefs regarding the consequences of using the pill and about their intentions to use OCs and other contraceptive methods. A year later, a report on their sexual activity and OC use over the course of the year was also obtained. Concerns about health and physical appearance differentiated subjects who intended to use the pill from those who did not. This study found that several beliefs reported by subjects did not relate to intentions or to actual contraceptive use. For example, the belief that using the pill would prevent pregnancy was not associated with intentions or with use. The

investigators inferred, based on this finding that the effectiveness of the pill as contraceptive was not in fact irrelevant. Rather, they contended that belief in its effectiveness did not discriminate between those who intended to use it and those who did not. Instead, perhaps there were other beliefs that discriminated between two groups more directly than did the beliefs about pill's effectiveness. This finding may be supportive of the assertion made earlier that factors other than the beliefs about OC effectiveness also accounted for intentions to use them in the future. One of the major drawbacks of this study was that it did not use any conceptual framework to base their results on.

Jaccard and Davidson (1972) conducted a study particularly relevant to the foregoing discussion about women's attitude toward using oral contraceptives. The authors asked the subjects (a college sample) to rate the concept of "using birth control pills" on a set of evaluative semantic differentials. They found that the measure of attitude was highly related to the subjects' beliefs about the consequences of using OCs and their evaluations of those consequences. An individual interview with an independent sample of 22 women was carried out to elicit 15 beliefs and 12 referents relevant to the use of OCs. For example, they were asked where they would go for more information about OCs and whether there were any particular individuals or groups who would approve or disapprove if they used birth control pills. The 12 most frequently mentioned referents that were included in the study were: mother, father, husband/boyfriend, zero population growth, women's magazines, and the 'religion I was brought up in.' Normative beliefs concerning each referent and their motivation to comply with the referents were assessed using appropriate scales. These two measures

were multiplied and the resulting products for the 12 referents were summed to provide a measure for the normative component. Subjects also indicated their intention to use OCs on another 7-point scale. Then a multiple regression analysis was performed. A multiple correlation of 0.835 was obtained for the prediction of intention to use OCs from the attitudinal and normative components of the theory. However, a major shortcoming of this study was that the investigators did not analyze various components of the scale and failed to provide information on scale reliability.

Another study, methodologically similar to the previous one, by the same researchers (Davidson and Jaccard, 1975) investigated the factors that underlie a woman's intention to use or not to use oral contraceptives. The respondents for this study consisted of a stratified random sample of 270 married women almost all of whom had children. The questionnaires used in the study consisted of measures of behavioral beliefs, evaluations of outcomes, normative beliefs, and motivations to comply with each referent. The measures were also taken of intentions to use birth control pills and attitude toward personal use of birth control pills. Approximately one year later women were re-interviewed and asked to report their use or nonuse of the pill during the past year. Consistent with expectations, a strong intention-behavior relationship ($r=0.85$) was observed, reflecting the fact that most women (93%) behaved in accordance with their intentions. Attitudes and subjective norms were in turn accurately predicted from beliefs based on salient outcomes and referents. With regard to normative beliefs, the women's major concerns centered on the expectations of their husbands or boyfriends and doctors. The women were highly motivated to comply with these referents. The women who believed that their husbands or boyfriends and doctors thought that they should use the

pills intended to do so. Conversely, the women who believed that these two referents opposed their use of birth control pills formed intentions not to use them. Only moderate motivations to comply were observed with respect to the remaining referents such as mother, father, friends and the religion they belonged to.

Almost all of these studies examined the influence of beliefs and attitudes on intentions to use OCs or other forms of contraception. None of the studies actually examined this relationship with reference to the choice of or intentions to choose contraception of any kind. Therefore, there exists a knowledge gap in contraception research that looks at the role of beliefs and attitudes on intention to choose (rather than use of) contraception of a particular kind. However, these studies did indicate that contraceptive behavior and other fertility-related intentions might be understood in terms of the theoretical model of reasoned action. Furthermore, the results of these studies indicated that a woman's intention to use a certain method of contraception is ultimately determined by her beliefs concerning the advantages and disadvantages of using the method in question and by her beliefs that relevant others think she should or should not use that method. Thus, it can be argued based on the evidence gathered above that a woman's intention to acquire oral contraceptives in a particular way should then be dependent on her attitudes toward the same and her perceived expectations of those who are important to her. Her beliefs, attitudes, and her subjective norm should also shape any preference a woman may have for acquiring OCs by different means. The argument above is therefore central to the adoption of a theoretical model of behavioral intention that incorporates these components.

Summary

The evidence from the reviewed literature suggests that contraceptive behavior (practice) can be better understood by examining the beliefs that underlie the attitude toward contraception. Attitudes toward contraception in general, and oral contraception in particular, seem to be based on the perceived advantages and disadvantages associated with the method in question. In addition, the available evidence indicates that a better representation of the relationship between contraceptive attitude and behavior is obtained when the mediating role of intention between the attitude toward the behavior and the ultimate behavior itself is taken into consideration. Any model that examines women's oral contraceptive acquisition behavior needs to take into account the relevant literature and consider the limitations of some of the models reviewed in the literature in explaining the OC acquisition behavior, particularly when the ultimate behavior itself is unobservable from the practical standpoint. The next chapter presents a theoretical framework that seeks to explain how oral contraceptive acquisition over-the-counter is understood in terms of women's intentions to engage in this behavior.

CHAPTER 3

THEORETICAL FRAMEWORK

Introduction

The theoretical framework and constructs that underlie the current research is briefly described in this chapter. This study utilizes the theory of reasoned action (Fishbein and Ajzen, 1975) in conceptualizing the research problem. A description of the theoretical model and hypothesized relationships among variables is presented here. The research questions that will be addressed by the study are also presented.

The theory of reasoned action is traditionally used for the purpose of predicting a specific behavior based on a concept known as behavioral intention. The theory holds that the behavioral intention is derived from a person's attitude toward performing the behavior in question and social norms that result from a person's perceptions of others' expectations toward performing that behavior. The attitude towards the behavior in turn is conceptualized to be a function of certain beliefs that a person holds regarding the performance of the behavior. The specific behavior in question is the acquisition of oral contraceptives over-the-counter. While all the model constructs to be discussed in this chapter are expected to underlie this specific behavior, the primary response variable of interest to this research is the behavioral intention--intention to acquire OCs over-the-counter. The beliefs regarding the acquisition of OCs over-the-counter, attitudes derived from these beliefs, and social norms are conceptualized to predict the intention to acquire

OCs over-the-counter. The literature reviewed in the previous chapter indicated that nonattitudinal variables (such as social expectations) were found to add substantially to the prediction of behavior when included in the model along with attitudinal variables. Thus, the theoretical framework to be used in the prediction of intention to acquire OCs over-the-counter will comprise both attitudinal and social constructs.

Theory of Reasoned Action

The model central to this study, the Fishbein model (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980), is designed to predict an individual's intention to perform a behavior. Figure.1 displays the schematic representation of the theory of reasoned action (TRA). This model is predicated on the assumption that most human behavior is to some degree volitional in nature and hence guided by the behavioral intent of the individual. Further, the model assumes that human beings make rational decisions and also make systematic use of information available to them. An individual's intention, according to the theory, is the immediate determinant of his/her behavior. The model contends that the strength of one's intention to perform a behavior is a function of two factors: (a) beliefs and attitudes about the consequences or outcomes of performing the behavior, and the evaluations of those consequences, and, (b) subjective normative beliefs about what others think the actor should do and the actor's motivation to comply with those beliefs. Thus, behavioral intentions (BI) are held to be a joint function of attitudes toward performing a particular behavior in a given situation and the social norms perceived to govern that behavior. Other variables, such as individual characteristics or situational aspects in which action occurs, are treated as external to the model. The model holds that

all such external variables influence behavioral intentions indirectly, that is, if and only if they influence one or more of the model's predictors. Fishbein (1972) emphasizes that the attitude being assessed is the individual's attitude toward the performance of that behavior, and not an attitude toward a given object, value, person, or situation.

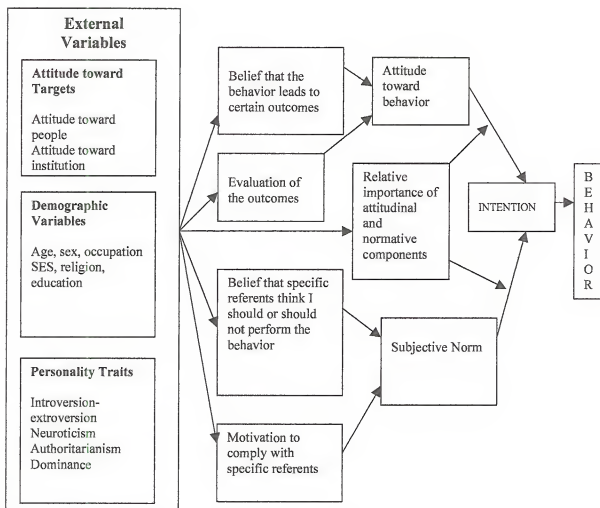


Figure 1: Theory of Reasoned Action (Ajzen and Fishbein, 1980, Fig 7.1, p84)
 External Variables: All variables not considered by the theory.

Determinants of Attitudes and Subjective Norm

An individual's attitude toward a behavior, according to the model's proponents, is a multiplicative product of the individual's beliefs about probable consequences of engaging in that behavior and the individual's subjective evaluation of these consequences. On the other hand, the multiplicative product of the individual's normative beliefs (belief that specific individuals or groups think he should or should not perform the behavior) and motivation to comply with these beliefs, determine the subjective norm of an individual. The model can be expressed symbolically as follows:

$$(B) \approx BI = (AB) w_1 + (SN) w_2$$

Where,

B - Overt behavior

BI - Behavioral intention

AB- Attitude toward performing the behavior in a given situation

SN – Subjective norm

W1, W2 - Empirically determined weights

First, AB, is the actor's attitude toward performing the behavior in question under a given set of circumstances. Here, a person's attitude toward a specific behavior is proposed to be a function of the perceived consequences of performing that behavior and of the person's evaluation of those consequences. Thus,

$$AB = \sum b_i e_i \text{ with } i = 1 \text{ through } n$$

Where b is the belief that performing behavior B leads to consequence or outcome I; e is the person's evaluation of outcome I; and n is the number of beliefs the person holds about performing the behavior B.

The second or normative component of the theory, SN, refers to the influence of social environment on the behavior. The subjective norm is the person's perception that most people who are important to him think he should or should not perform the behavior in question. According to the theory (Fishbein and Ajzen, 1975), the general subjective norm is determined by the perceived social expectations of specific referent individual's or groups, and by the person's motivations to comply with those expectations.

Symbolically,

$$SN = \sum b_i m_i$$

Where b_i is the normative belief (i.e., the person's belief that reference group or individual i thinks he should or should not perform behavior B); m_i is the motivation to comply with referent i ; and n is the number of relevant referents. According to the theory, the $b_i m_i$ products are computed for each relevant reference group and summed. The sum is viewed equivalent to a "generalized normative belief," i.e., subjective norm (SN).

According to the proponents, the empirical weights w_1 and w_2 are expected to vary with the kind of behavior which is being predicted, with the conditions under which the behavior is to be performed, and with the person who is to perform the behavior. Some behavioral intentions may be influenced more by normative considerations (expectations of friends, family etc.) than by attitudinal considerations (the expected outcomes of the act). The reverse may be true for some other behaviors. Fishbein and Ajzen (1975) point out that the weights for the attitudinal and normative components are estimated by using standardized regression coefficients resulting from multiple regression

analyses. Thus the present equation represents a multiple regression with two predictors AB and SN, with the criterion being I, the behavioral intention under consideration.

As pointed out earlier, any additional variable is held to influence BI if, and only if, it affects one or more of the model's predictors. Thus, according to Fishbein and Ajzen, situational variables, personality characteristics, etc. will influence a person's behavioral intentions only if they are related to AB or SN, or if they influence the relative weights of the two components. It should be noted here that the attitudinal and normative components of the model have a direct influence on BI, which in turn is expected to account for most of the behavioral variance. Thus, according to the theory, if one can predict BI, one can also predict B with only slight attenuation.

Description of the Model Constructs

According to Ajzen and Fishbein (1980), the attitude toward a behavior is a person's positive or negative evaluations of performing that behavior. Although the behavior in question in this study is that of acquiring oral contraceptives over-the-counter (Figure 2), the intention to acquire OCs over-the-counter is the predicted variable of interest in this research. This model essentially holds that the relationship between the OC acquisition behavior and attitude toward acquiring OCs over-the-counter is mediated by the intention to acquire OCs over-the-counter. This behavioral intention is a function of a person's attitudes toward performing the behavior (personal component) and subjective norms about performing the behavior (normative or social component). Further, a component called intention to acquire oral contraceptives OTC mediates the relationship between attitudes and the behavior. A woman's attitude toward performing a

behavior, such as acquiring pills over-the-counter, is determined by her salient beliefs about doing the same. People usually believe that performing a given behavior will lead to both positive and negative consequences. Their attitude toward the behavior correspond to the favorability or unfavorability of the total set of consequences, each weighted by the strength of the person's beliefs that performing that behavior will lead to each of the consequences (Ajzen and Fishbein, 1980). For example, a belief concerning the acquisition of birth control pills OTC could be that a woman might miss her regular health examination, which she typically receives on a visit to a health care clinic – which she might consider to be an unfavorable negative consequence. Similarly, another belief about acquiring oral contraceptives OTC may be of that of convenience and cost savings, a favorable positive consequence. Given this set of beliefs, the theory holds that a person's attitude toward a behavior can be measured by multiplying her evaluation of each of the behavior's consequences by the strength of her belief that performing the behavior will lead to that consequence and then summing the products for the total set of beliefs (Ajzen and Fishbein, 1980).

The subjective norm is the individual's perception that most people who are important to him or her think s/he should or should not perform the behavior in question (Fishbein and Ajzen, 1975; p.302). The general subjective norm is determined by the perceived expectations of specific referent individuals or groups, and by the person's motivation to comply with these expectations. It is believed that in the behavior relating to the acquisition of OCs over-the-counter, expectations of a person's family or friends may play a significant role. However, in other instances, the expectations of the society at large may be most influential. Typically, the expectations of more than one reference

group will have to be considered. In addition, it is also necessary to measure the individual's motivation to comply with each of the relevant groups. According to the equation above, the bX_m products are computed for each relevant reference group and summed.

Some of the consequences of performing a given act may please or displease relevant reference individuals or groups, and it may lead to reward or punishment from a given referent. Fishbein and Ajzen (1975, p.306) acknowledge that the concept of motivation to comply has been interpreted differently by researchers. They point out that motivation to comply at times may not be behavior-specific. That is, a person may be generally motivated to comply with his or her referent regardless of that referent's particular demands. Alternatively, the motivation to comply could refer to referent's wishes concerning the particular behavior or behavioral domain under consideration. However, they contend that, referring to both theoretical and empirical grounds, motivation to comply can be best conceived as the person's general tendency to accept the directives of a given reference group or individual. If a person's general tendency is to comply with her referent concerning a much larger behavioral domain--such as reproductive behavior, taken as a whole, as opposed to just OC acquisition--then she is much more likely to accept the directives coming from that referent. Consider, for example, the normative belief that "my mother thinks that I should not use any form of contraception." A person can hold this belief about others' perceptions independent of her own beliefs regarding the behavior per se, such as "I believe buying birth control pills over-the-counter is safe." Here, even when a person holds positive beliefs about the action, the subjective norm is contradictory to such beliefs. More over, it can be seen that

the individual's perceptions of referent's beliefs related to a much larger behavioral domain – contraception in general, whereas, the individual's beliefs toward performing the behavior related more specifically to the acquisition of OCs OTC. Another example: “my partner thinks I should obtain birth control pills OTC to make family planning easier (a subjective norm),” while “I think it is not safe for me to use birth control pills bought OTC for family planning since they cause major side effects.” Here, too, the perception of what a particular referent might think is at odds with one's own personal beliefs. Yet, such perceived expectations, regardless of one's own beliefs, may govern the ultimate choice of behavior. Thus, the expectations of others regarding one's behavior in question may in fact influence one's own attitude toward the behavior. In other words, beliefs about a referent's reactions may have different effects on the attitudinal and normative tendencies of a person and, consequently, on his/her behavioral intentions.

Fishbein and Ajzen (1975) note that normative beliefs may be inferred from the referent's perceived attitude toward performing a given behavior. If the referent is perceived to have a favorable attitude toward performing the behavior, or more specifically, toward the person's performing the behavior, the normative belief may be formed that the referent thinks the person should perform the behavior in question. Thus, the framework suggests that the oral contraceptive behavior may in fact be understood in terms of the theoretical model of behavioral intention.

Research Questions

Several research questions and hypotheses are derived by examining the relationships of variables in the model specified in Figure 2.

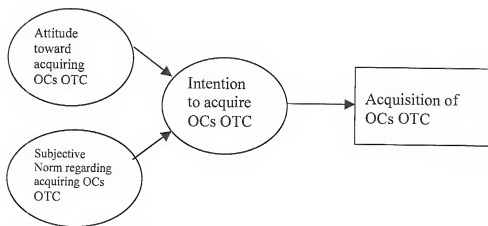


Figure 2: Theory of Reasoned Action Applied to OC Acquisition

In writing these questions, a hypothetical situation that individuals have legal access to OCs over-the-counter is assumed. The research questions examined are:

1. What is the predictive power of attitude toward acquiring OCs over-the-counter in the prediction of a woman's intention to acquire OCs over-the-counter in the hypothetical situation that it is the legal means of acquisition?
2. What are the beliefs that will describe the differences in intention between women who intend to acquire oral contraceptives over-the-counter and those women who do not?
3. Are attitudes regarding perceived risks and benefits of acquiring OCs over-the-counter predictive of a woman's intention to acquire them through that means?
4. What is the relationship between a woman's subjective norm, including motivation to comply with the expectations of her significant others, and her intention to acquire OCs over-the-counter?
5. What is the relative contribution of attitudes and subjective norms in predicting intentions to acquire OCs over-the-counter?

Research Hypotheses

Even though the nature of this investigation is largely exploratory, several hypotheses have been developed here. These hypotheses are based on the model and empirical studies discussed in the accompanying literature review. The hypotheses specifying the relationships among variables are consistent with the theoretical framework and concepts incorporated in the model. Furthermore, these hypotheses address the research questions stated above as well as the study objectives outlined previously in the proposal.

The first two research questions are directed at the explanatory power of the theory of reasoned action in the prediction of behavioral intention to acquire oral contraceptives over-the-counter. The following hypothesis is proposed in support of the first research question. The second research question is exploratory in nature and no hypotheses have been proposed to support it.

H1: A woman's intention to acquire oral contraceptives over-the-counter may be predicted from (a) her attitude toward acquiring them OTC and (b) her normative beliefs, weighted by her motivation to comply with those perceived norms.

The next research question addresses different factors -- beliefs about biomedical, social, and economic aspects of OC use -- that influence an individual's decision to acquire oral contraceptives OTC. Although there exists limited empirical evidence to support these hypotheses, the major thrust for the statement of this hypothesis comes from the preliminary examination of OC-related attitudes carried out by the authors (Nayak et al, 1994). In addition, opinions expressed by the experts (Grimes, 1993;

Trussell et al., 1993; Potts, 1995) and communications appeared in academic journals further justify the generation of the hypothesis stated below.

H2: There will be a positive correlation between favorable attitudes associated with the use of OCs acquired OTC and intentions to acquire OCs through that means.

The fourth research question addresses a woman's perceptions of general social expectations regarding the behavior as a function of the person's set of beliefs about what significant other people want the person to do. With respect to the current research, the Fishbein model posits that women's perceptions of subjective norms regarding the choice of means to acquire OCs will be associated with the perceived expectations of her partner, mother, father, and other relevant people regarding the method, weighted by her motivation to comply with those expectations.

H3: Perceptions of the wishes of other people, weighted by the woman's motivation to comply with those wishes, will be related to a woman's intention to acquire OCs over-the-counter.

H4: The directly measured perceptions of subjective norms more supportive of OC acquisition over-the-counter will be associated with stronger intentions to acquire OCs over-the-counter.

The last research question examined in this study is purely exploratory in nature. Therefore, no hypotheses have been proposed to address this question in the study.

Constitutive Definitions of Model Constructs

Attitude toward behavior. A person's attitude toward behavior is his or her beliefs about the probable consequences of engaging in a behavior multiplied by his or her subjective evaluation (e.g. the degree of "goodness" and "badness") of each consequence.

Behavioral intention. An assessment of an individual's own subjective probability that he or she will perform a given behavior. A psychological construct distinct from attitude, it represents the person's motivation in the sense of his or her conscious plan to exert effort to carry out a behavior.

Motivation to comply. A measure of how important it is to an individual that s/he behave in the way that those important to him or her think s/he should behave.

Normative belief. This is a belief underlying a person's subjective norm that specific individuals or groups think s/he should or should not perform the behavior.

Subjective Norm. This is the person's perception that most people who are important to him or her think s/he should or should not perform the behavior in question, also known as "generalized normative beliefs".

CHAPTER 4 METHODOLOGY

Introduction

This project required an instrument that would measure attitude toward acquiring OCs over-the-counter, subjective norms regarding the acquisition of OCs over-the-counter, and intention to acquire OCs over-the-counter. The mail questionnaire consisted of measures on women's beliefs about acquiring OCs over-the-counter, evaluations of these beliefs, subjective norms regarding the acquisition of OCs OTC, and intention to acquire OCs over-the-counter. In addition, direct measures of general attitude toward acquiring OCs over-the-counter and subjective norms were also included in the questionnaire as a method to provide validity checks to the measures.

The survey research procedures outlined in Dillman (1978) were used to guide the development of the mail questionnaire and follow up telephone interviews. Following the development of the initial version of the survey instrument, it was pilot tested and revised for use in the research being presented. As part of the main research, the follow-up telephone interviews of subjects who did not respond to the mail questionnaire was conducted approximately five weeks after the initial mailout of the questionnaire. This chapter reports on sample selection, data collection procedures, measurement of the independent and dependent variables, and validation based on the results from pilot studies, and the data analysis strategy for testing research hypotheses.

Sampling

Subjects

The study population consisted of women attending the University of Florida at the Gainesville campus. Two randomly selected samples of women registered for the Summer and Fall, 1998 semesters were used for the pretest and for the main study respectively. All women aged 18 and over and enrolled in the University of Florida were eligible for inclusion in the study. University of Florida students are geographically and culturally diverse. They come from more than 100 countries, all 50 states and each of Florida's 67 counties. In Fall 1997, University of Florida had a total enrollment of 41,713, of which 2561 were African American students, 3767 were Hispanic students, 2381 were Asian-American students, and 1751 were international students. Some 46 percent of the students were women. Of the nearly 42,000 students enrolled in the Fall of 1997, some 77 percent were undergraduates, 17 percent were graduate students and 6 percent were in professional programs (including dentistry, law, medicine, pharmacy and veterinary medicine).

The use of contraception of any kind was not used as a criterion for inclusion. It was reasonable to expect in any given population – particularly in a campus population - for some women who have not used any form of birth control in the past to be contemplating the use of OCs or another form of contraception in the future. Regardless of the history of current use or nonuse of contraception, women were expected to hold certain views regarding the acquisition of oral contraceptives.

Sample Selection

A listing of female students who were enrollees at the University of Florida was obtained from the Registrar's office. This list constituted the sampling frame for the study. A systematic sampling strategy outlined in Agresti and Finlay (1986) was employed to select subjects for participation from the list provided. According to this method, a systematic random sample is one in which (a) a member is chosen at random out of the first k names in the sampling frame, and (b) every k th member after that one is selected. Here $k = N/n$; where, N is the female student population size, and n is the desired sample size derived from the pilot study.

Procedures to Enhance Participation

Efforts were made by the investigator to establish trust with subjects by stressing the confidentiality aspect of their response to the questionnaire. In addition to assuring the anonymity, the subjects were told of the value of their input to this research endeavor in order to emphasize the importance of their contribution to health care research. They were made aware that their participation in the study contributed to the society by helping the researchers gain improved understanding of the problems and issues facing the policy makers regarding the use and sale of OCs in the US. Questionnaires were made brief, their format attractive, and their content as easy to understand as possible. The procedures recommended in Total Design Method (TDM) proposed by Dillman (1978) to enhance participation in mail surveys were adopted in the current study. The financial costs associated with stationary, postage, telephone interviews etc. were paid by the funds

allocated by the Division of Sponsored Research, University of Florida, in support of doctoral dissertations.

Sample Size Estimation

The proposed research was considered to be largely exploratory, thereby rendering a priori predictions of the distribution of values of the study variables impossible. Therefore, the determination of the sample size was done following the pilot study, which validated the instrument used in the study. The approximate sample size needed to perform the proposed statistical analyses in the study was based on the test statistics obtained and the distribution of values of study variables resulting from the pilot test of the instrument. For example, the sample size estimation was based on the association statistics such as bivariate correlation coefficients and/or multiple correlation statistics, as reflected in the research hypotheses.

Data Collection Procedures

A new questionnaire, specifically developed for the purpose of measuring women's attitude toward acquiring OCs over-the-counter was used to collect data (Appendix A). The research data was collected in two steps. The preliminary step involved the collection of data for the pilot testing of the instrument. The questionnaire containing measures of OC attitudes and intention to acquire OCs over-the-counter were used in the pilot study to obtain data to establish instrument reliability and validity. The campus Institutional Review Board permission was obtained through appropriate documentation.

Procedures for the Written Questionnaire

On July 23, 1998, a thousand questionnaires were mailed to the previously selected respondents along with a self-addressed, stamped envelope. A cover letter was designed for informing the potential respondents of the study objectives and requirements (Appendix B). The data collected in this step was used for further validation of the instrument.

The second step of the study involved data collection for the purpose of testing research hypotheses, following instrument revalidation. On September 16, 1998, a mailing procedure similar to the one described above for the pilot-testing of the instrument was used for the final study sample. A randomly selected sample of 500 female students was used for the final study. However, for this sample, a combination of mail and telephone follow up procedures was used to enhance participation in the study. The questionnaires were marked with code numbers for the identification purpose only, linking them to the subject's name and address. The respondents' names were then checked off from the list when a completed questionnaire was received. The file linking code numbers, address, and telephone numbers was kept in a password protected file accessed only by the investigator. Subjects were informed of the objective for number coding in the cover letter (Appendix C) and were assured of complete confidentiality of their response to the questionnaire. A reminder postcard was mailed to the nonrespondents on September 30, 1998, exactly two weeks after the original mailout (Appendix D). An additional copy of the questionnaire was sent to those who had not received or lost the questionnaire, following telephone or e-mail requests to the

investigator. This consisted of a cover letter, including restatement of basic appeals from the original cover letter, a replacement questionnaire, and another return envelope.

The written questionnaire was 5 pages long and had 48 items. It was expected that the subjects would need about 10-15 minutes to complete the questionnaire. Written questionnaires consisted of independent and dependent variables, both measured at the same time. Subjects mailed completed questionnaires to a post office box number.

Procedures for the Telephone Survey

Where possible, follow-up telephone calls were made to the nonrespondents, urging them to respond to the survey. The telephone interview was conducted during the first week of November 1998, approximately one month after the nonrespondents received the reminder postcards. For the purpose of telephone administration of the survey, the investigator sought professional assistance. The services of Florida Survey Research Center (FSRC), a not-for-profit, on-campus survey organization affiliated with the University of Florida, were used to approach the subjects who had not yet responded to the survey. A list of nonrespondents containing telephone numbers of the subjects was provided to the Center by the investigator. The IRB exemption letter was used to initiate the process and the protocols outlined in the IRB manual were adopted to assure confidentiality of responses and subject anonymity. Specifically, the FSRC survey services included the following:

1. Preparation of survey questions in the format used for telephone interviews;
2. Training of interviewers and other necessary steps to prepare for the interviews;

3. Efforts to contact all of the individuals in the sample of students who had not completed the mail questionnaire;
4. Three attempts, including two call backs in an attempt to complete the interview;
5. Maintenance of records of each contact /attempted contact (Appendix E) including reasons for refusing to participate;
6. Careful review of each completed instrument for accuracy;

The information available at the time on contact numbers obtained from the Registrar's office included a few non-working numbers, business numbers, as well as residential telephone numbers. The average length of the interview was 12 minutes. Where possible, qualitative information that was available from the respondents was recorded by the interviewers.

Study Variables and Operationalization of Constructs

General Variable Description

Table 4.1 lists the variables examined in the study and information on their operationalization and measurement. Table 4.2 depicts a semantic hierarchy of variables representing the relevant model constructs and their measurement. The predictor variables for this study were attitude toward the behavior, namely, the attitude toward acquiring OCs over-the-counter, and subjective norms regarding the acquisition of OCs OTC.

Table 4.1 Description of Study Variables

| Variable | Measurement |
|---|--|
| Demographic Variables | |
| Age | Years of age |
| Race | By categories: African American, white, Asian American, Hispanic, other |
| Religion | Categories: Catholic, Protestant, Jewish, Other |
| Other variables of interest | |
| Previous use of OCs | Dichotomous: 1=yes 0=no |
| Current use of OCs | Dichotomous: 1=yes 0=no |
| Duration of OC use | Categories scale: months of use |
| Type of health professional seen for OCs | Categories: Physician, NP, Midwife, Other |
| Plans to use OCs in the future | Categories: Yes, No, Don't know |
| Insurance coverage i) for MD visits ii) for prescription or nonprescription drugs | Categories: Yes, No, Don't know Categories: Yes, No, Don't know |
| Predictor Variables | |
| a. Attitude toward acquiring OCs over-the-counter (Indirect Measure) | <u>5-point Likert type of scale</u> (9 items) |
| Evaluation of Consequences Beliefs about acquiring OCs OTC | <i>Very important (+2), very unimportant (-2)</i> <i>Very likely (+2) very unlikely (-2)</i> |
| b. Subjective norms regarding the acquisition of OCs OTC (Indirect Measure) | <u>5-point Likert type of scale (3 items)</u> |
| Normative beliefs Motivation to comply | <i>Very likely (+2) very unlikely (-2)</i> <i>Very likely (+2) very unlikely (-2)</i> |
| c. General attitude toward acquiring OCs over-the-counter (Direct Measure) | <u>5-point Likert type of scale (2 items)</u> <i>Extremely good (+2) Extremely bad (-2)</i> <i>Extremely favorable (+2) Extremely Unfavorable (-2)</i> |
| d. Subjective norms regarding the acquisition of OCs (Direct Measure) | <u>5-Point Likert scale (One item)</u> <i>Very likely (+2) very unlikely (-2)</i> |
| Predicted Variable | |
| e. Intention to acquire OCs OTC | <u>5-point Likert type of scale (One item)</u> <i>Very likely (+2) very unlikely (-2)</i> |

Table 4.2 Semantic Hierarchy in OC attitude research

| Constructs/ Concepts | Attitude Toward Behavior (Indirect Measure) Attitude toward acquiring OCs over-the-counter | | Attitude Toward Behavior (Direct measure) Attitude toward acquiring OCs over-the-counter | Behavioral Intention |
|---------------------------------------|--|---|--|--|
| | Behavioral Beliefs | Subjective Norm | | |
| Variables | Beliefs about risks of using OCs Beliefs about benefits of using OCs. (Evaluation of beliefs X belief strength = attitude) | Normative beliefs about acquiring OCs OTC Motivation to comply with referents regarding the acquisition of OCs OTC | Attitude toward acquiring OCs over-the-counter | Intention to acquire OCs over-the-counter |
| Measurement (observables) Examples | (5-point differential scale) A. Evaluation of Beliefs I indicate on a scale below the degree of "importance" you think the effect of experiencing nausea as a consequence of using pills would have for you <i>Very important very unimportant</i> B. Subjective probability (5-point Likert scale) 1. What is the likelihood that you will experience minor side effects such as mild nausea when you have acquired pills without a doctor's prescription? <i>Very likely Very unlikely</i> 2. What is the likelihood that you will avoid unplanned pregnancy when you have acquired pills without a doctor's prescription? <i>Very likely very unlikely</i> | (5-point Likert-type scale) A. Normative beliefs 1. If you decided to use birth control pills, how likely is it that your <u>family</u> would think that you should buy them without a doctor's prescription? <i>Very likely Very unlikely</i> 2. If you decided to use birth control pills, how likely is it that your <u>partner</u> would think that you should buy them without a doctor's prescription? <i>Very likely Very unlikely.</i> B. Motivation to comply "Generally speaking, I will do what my family thinks I should do." <i>Strongly Agree ----- Strongly disagree</i> | (5-point Likert scales) 1. "In my opinion, acquiring OCs over-the-counter without an MD's prescription is" <i>Extremely good Extremely bad</i> 2. "My opinion about acquiring OCs over-the-counter without an MD's prescription is:" <i>Extremely favorable -- -----Extremely unfavorable</i> | (5-point Likert-type scale) following a hypothetical scenario..... 1. Assuming that you have decided to use birth control pills, how likely is it that you would acquire them <u>without</u> a physician's prescription? <i>Very likely Very unlikely</i> |

These variables were used to predict the individual's intention to acquire OCs over-the-counter. The purpose of each variable is discussed in detail in the following section. Consistent with the theoretical formulation and the literature reviewed, the study instrument also consisted of direct measures (as opposed to multiplicatively derived

measures) of both attitude and subjective norm. The items corresponding to these constructs provided a direct measure of women's attitudes and subjective norms regarding the acquisition of OCs over-the-counter. These measures served as validity checks for the theoretical constructs embedded in the TRA. For example, based on the theory, the measures of these constructs, derived indirectly by the multiplication of the model components, should correlate positively with the measures taken directly. The statistical check performed this way further provided us with the means to confirm the theoretical validity of the model being used. Therefore, it was a point of interest to the current investigation to include both indirect and direct measures of model predictors.

In sum, consistent with Fishbein formulation, both direct and indirect measures for attitude toward acquiring OCs over-the-counter and the subjective norm regarding the same were developed in this study. Direct measures were those that incorporated attitude and subjective norm statements on a 5-point scale designed to measure response differentials – such as 'very important' and 'very unimportant,' 'extremely favorable' and 'extremely unfavorable,' 'very likely' and 'very unlikely' etc. For example, an item, "My attitude about obtaining birth control pills without a doctor's prescription," measured directly a woman's attitude toward acquiring OCs over-the-counter on a 5-point, 'extremely favorable- extremely unfavorable' scale. Similarly, the subjective norm regarding the acquisition of OCs over-the-counter was measured using the item, "Most people who are important to me and whose opinion I value think that I should obtain my birth control pills over-the-counter, without a physician's prescription," on a 5-point 'very likely—very unlikely' scale. Indirect measures were derived as the multiplicative products of belief strength (i.e., perceived likelihood) and evaluation of consequences

(for attitude measures), and as multiplicative products of normative beliefs and motivation to comply (for subjective norm measures).

Attitude Toward Acquiring OCs Over-The-Counter (Indirect Measure)

According to Ajzen and Fishbein (1980), the attitude toward a behavior is a person's positive or negative evaluations of performing the behavior. The behavior in question in this study was that of acquiring oral contraceptives OTC, and the response variable of interest was the individual's intention to acquire OCs over-the-counter. A woman's attitude toward performing a behavior in question is determined by her salient beliefs. People usually believe that performing a given behavior will lead to both positive and negative consequences. Their attitude toward the behavior corresponds to the favorability or unfavorability of the total set of consequences, each weighted by the strength of the person's beliefs that performing that behavior will lead to each of the consequences (Ajzen and Fishbein, 1980). A person who believes that the acquisition of OCs over-the-counter leads to a positive consequence, such as easier fertility control, may find it desirable to buy them OTC. As a result, she is likely to hold more favorable attitudes toward acquiring OCs over-the-counter. Similarly, beliefs about negative aspects of acquiring OCs over-the-counter--such as minor side effects--may lead to more negative, less favorable attitudes toward acquiring them over-the-counter. According to the theory, a person's attitude toward a behavior can be predicted by multiplying her evaluation of each of the behavior's consequences by the strength of her belief that performing the behavior will lead to that consequence and then summing the products for the total set of beliefs (Ajzen and Fishbein, 1980). The salient beliefs in the proposed

research can be represented in terms of the following categories: (i) her beliefs about risks associated with using OCs, (ii) her beliefs about benefits of using OCs. Each one in turn is discussed in detail below.

The salient beliefs incorporated in the study instrument basically related to the beliefs about possible outcomes of using oral contraceptives acquired OTC. According to the theory, these are termed behavioral beliefs. Belief statements representing the categories above were presented to each subject and her degree of evaluation (i.e., important/unimportant) of each possible outcome when using OCs was measured. This part of the scale is referred to as the evaluation component of the scale. Then the responses to items that measured subjects' perceived likelihood (or belief strength) of each outcome resulting from the use of OCs when they are acquired OTC as well as with a physician's prescription were scored on the questionnaire. This part of the scale is referred to as the belief component of the scale. In other words, the instrument consisted of a subscale that measured evaluations of the probable outcomes of using OCs in general, and subscales that measured the perceived likelihood of each of these outcomes resulting when OCs are acquired OTC or with a physician's prescription. The scores on each item on the evaluation and belief components of the scale were then multiplied and summed across all the items for each individual. This score represented the attitude toward acquiring OCs over-the-counter. Thus, attitude scores were calculated for each individual, representing the OC-attitude for that individual. More details on the belief categories represented in the scale are as follows.

Beliefs about risks

An individual's beliefs about risk in this case may be one of two types. The first type of risk perception occurs due to the direct effects of the drug on the body. These are inherent risks of minor and serious side effects of the drug itself, regardless of the type/level of supervision. The second type of perceived risk occurs due to a) the risk of therapeutic failure as a result of lack of professional oversight, or b) a general health risk associated with the foregoing of certain preventive health services. Such perceptions may arise due to what can be called indirect effects associated with the use of the drug. These perceptions are usually psychosocial in origin.

One of the major perceived risks of using the pills is the susceptibility of an individual to various types of ovarian and endometrial cancers, breast cancer, and stroke – often termed as direct effects of the drug on the body. Some minor side effects such as pain in the legs, vision defects, breakthrough bleeding, weight gain etc. also generate similar risk perceptions. The second type of perceived risk is often the result of imperfect use of OCs without proper clinical counseling. This risk factor is likely to figure into the judgments of those women who might consider choosing only that option which offers some kind of medical safeguards over the use of OCs. OCs are contraindicated in some women with conditions that rule out the use of pills. Women who are aged over 35 and who smoke, and those who are pregnant, or those who breast-feed are the unlikely candidates for oral contraceptives. Also, myriad brands and different strengths of OCs (often considered to be more of a marketing decision than one of any therapeutic relevance) will possibly enhance the perception of risk women may associate with a given option.

The perceptions of general health risk stem from women's belief that acquiring OCs from a source that involves little or no professional supervision may mean foregoing certain preventive health services and screening for cancer. The status quo requires that women submit themselves to some preventive health services like pelvic examination and pap smears to screen for cancer, even though the health conditions being screened for are unrelated to decisions about oral contraception.

Another perception of risk, neither direct nor indirect, is the risk of having to pay more for OCs and related services if they are sold OTC. It is believed that making OCs available OTC may present some obstacles for certain women. Some fear that poor women, who obtain OCs inexpensively from family planning clinics, may now pay higher prices because of the possible discontinuation of price discounts by companies to these clinics. A possible lack of private insurance and/or Medicaid coverage for OCs is believed to present problems to women who may wish to acquire OCs without a physician's prescription. Thus, a woman faced with options for acquiring OCs by different means is likely to weigh the benefits and risks involved in choosing an option and hold intentions for acquiring OCs through only that means which poses minimal risk to herself and to the society. A more detailed discussion of both direct and indirect effects of using OCs is presented in the section on literature review. Specifically, five items representing women's beliefs about risks of using OCs per se were incorporated in the questionnaire. These items were expected to tap into women's perceptions of risks--both direct and indirect--stemming from the use of OCs.

Beliefs about benefits

The most important benefit of using oral contraceptives is the prevention of pregnancy and the regulation of menstrual cycle. Other important beliefs about the possible benefits include benefits accruing from improved compliance, professional counseling and possible convenience depending on the way in which OCs are acquired. Perceptions of benefits will also include beliefs about cost savings when OCs are acquired OTC. A woman may strongly believe that seeing a physician in order to receive her birth control advice is not an effective means of exercising her reproductive option, either because she feels competent and knowledgeable enough to care for herself or because it is not worth her time, and thus may attach moderately negative value to it. At the same time, a woman may believe that seeing a physician is necessary because it is likely to ensure her overall health, an outcome to which she is likely to attach a very high value. The OCs are believed to protect against several forms of cancer - a benefit so potent that some women are even strongly recommended to use OCs on a regular basis regardless of their need for contraception. Also of benefit to a woman is the possible use of OCs as post-coital or emergency contraceptives (morning-after-pill). In addition, our preliminary investigation (Nayak et al., 1994) also indicated the convenience aspect of OC acquisition. In this study, some women when told of an OTC option for the acquisition of pills, felt that OCs were more convenient to acquire OTC since this option entailed no physician visits or long appointments. Some women also felt OCs were convenient to get, particularly from family planning clinics and the student health care clinic on campus, since this type of acquisition did not entail parental consent.

A more detailed account of monetary aspects of acquiring OCs from different sources is presented in the section on literature review. The reviewed literature indicates that OCs may be cheaper to acquire OTC for those who obtain their pills from office-based practitioners and those who do not have prescription insurance coverage. These women are better off receiving them over-the-counter perhaps after an initial visit to the physician if felt necessary. Such women are also believed to save money on unnecessary physician visits, particularly for refill authorizations. Thus, conditions mentioned above were conducive to shaping a woman's beliefs about costs associated with each of the options available to her and influence her evaluations of each of the possible consequences. Therefore, beliefs about benefits contained items measuring the following beliefs: beliefs about prevention of pregnancy and regulation of menstrual cycle, beliefs about convenience, and beliefs about emergency contraception. Four items on the instrument were expected to capture the perceptions of benefits of using OCs.

In sum, the evaluation component of the scale consisted of nine items representing nine different possible consequences when using oral contraceptives, each corresponding to the beliefs categorized above. The items were generated based on the literature reviewed on contraceptive behavior and preliminary work conducted by the investigator. Women rated each of the nine consequences in terms of its importance: how important (very important) or unimportant (very unimportant) it would be if using OCs had that consequence for them. For example, the respondents would rate on a 5-point scale the degree of importance, ranging from very important to very unimportant, each consequence--such as minor side effects, prevented pregnancy, regulation of menstrual cycle, and so forth--has for them. A scale ranging in value from +2 (Very important) to -

2 (very unimportant) was created for this purpose. Thus, higher scores for an individual represented more positive evaluations and lower scores signified more negative evaluations. Furthermore, the items 1 through 4, and item 9 on the evaluation subscale--all representing negative consequences of using OCs--were reverse scored to capture the negative evaluations.

The belief component of the model (also known as subjective probability or perceived likelihood) was then measured by having women rate how likely they thought it was that they would experience each of the outcomes if they chose to use OCs acquired OTC, and with a physician's prescription. Thus the subjects were asked to rate the likelihood of each consequence occurring on two sets of scales representing acquisition of OCs over-the-counter and with a physician's prescription respectively. On a 5-point scale created for this purpose, women rated their likelihood estimates ranging from very likely to very unlikely. For example, women were asked how very likely or very unlikely they thought they were to avoid unplanned pregnancy or gain access to OCs as emergency contraception pills etc. if they acquired OCs over-the-counter, or with a physician's prescription. The scale values ranged from +2 (very likely) to -2 (very unlikely) to determine the subjective probability of occurrence of each of the nine consequences of using OCs listed previously. More positive scores for a woman represented the higher likelihood that she thought the consequence in question would result.

As specified in the theory of reasoned action, the evaluation of a given consequence was then multiplied by the estimate of the likelihood that using OCs acquired OTC would result in that outcome. The resulting scores were summed across

the consequences to provide a “belief X value” (Σb_{ie}) score for acquiring OCs over-the-counter and with a physician’s prescription. Thus, the OC-attitude score for each person was derived as a summated product of these terms.

General Attitude Toward Acquiring OCs Over-the-Counter (Direct Measure: A-act)

General attitude toward acquiring oral contraceptives OTC was measured by having subjects indicate on 5-point bipolar scales, their favorability for obtaining them OTC. For example, the respondents were asked to indicate their opinion on a 5-point scale, ranging from extremely good (+2) to extremely bad (-2), and from extremely favorable (+2) to extremely unfavorable (-2), regarding their assessment of the appropriateness of acquiring OCs over-the-counter, with a neutral value anchored at zero. The experts in the literature (Cone and Foster, 1995; p.169) have critiqued the use of single-item measures, especially when reliability of such measures is not available. Therefore, the attitude items were presented twice to obtain a more reliable measure of the construct. The general attitude toward a method was then calculated by averaging the two ratings. Higher scores represented more favorable attitudes toward acquiring oral contraceptives OTC.

Subjective Norm Regarding the Acquisition of OCs Over-the-Counter (Indirect Measure)

Consistent with the TRA, both direct and indirect measures for subjective norm were taken. The subjective norm is the perception that most people who are important to the individual thinks she should or should not perform the behavior in question (Fishbein and Ajzen, 1975 p.302). Further, it refers to the person’s perception that important others

desire the performance or nonperformance of a specific behavior. According to the theory, the subjective norm was determined by the perceived expectations of specific referent individuals or groups, and by the person's motivation to comply with these expectations. The theory holds that, the more a woman perceived that others who are important to her thought she should buy her OCs over-the-counter, the stronger were her intentions to acquire them OTC.

Normative Beliefs and Motivation to Comply

Each respondent was asked to rate how she believed each of the people important to her would feel about her using OCs acquired OTC. Scales were created separately to measure a woman's perceived expectations of others regarding the acquisition of OCs over-the-counter and her motivation to comply with those expectations. Three items each constituted subscales for normative beliefs and motivation to comply. These items were written to measure a woman's perceptions of what four other individuals or groups important to her will think regarding her intention to acquire OCs OTC. On a 5-point scale women were asked to indicate how each individual or a group of individuals (i.e., family, close friends, and partner) would feel about her choosing to acquire oral contraceptives OTC. The scale ranged from very likely (+2) to very unlikely (-2) that a particular person would feel that she should use OCs acquired OTC. Similarly, motivation to comply with each referent regarding the acquisition of OCs was measured on a 5-point scale ranging from strongly agree (+2) to strongly disagree (-2) that she will comply with the perceived expectations of the important person. The scale values were anchored similarly as before. For each person rated, scores on a woman's motivation to

comply with each referent was then multiplied by her perceived expectations of that referent regarding the OC acquisition OTC. The scores for these three referents were then summed, providing a single score for the subjective norm regarding the acquisition of OCs over-the-counter.

Subjective Norm (Direct Measure)

This was a direct measure of subjective norm. Consistent with the recommendation made by the proponents of TRA, the scale consisted of basically one item (Ajzen and Fishbein, 1980), measuring women's responses on a 5-point scale ranging from 'very likely' (+2) to 'very unlikely' (-2), with scale values anchored similarly as before. For example, a person may perceive that most people who are important to her and whose opinion she values think that she should or should not perform the behavior in question. The scale developed for this purpose measured subjects' perceptions of what others think she should do. The rating on the single item was considered as a direct measure of subjective norm for OC acquisition OTC. More positive scores represented stronger normative influence on the person regarding the acquisition of OCs over-the-counter. A positive correlation of this measure with that obtained indirectly for subjective norms was to provide a validity check for the TRA model used in the study.

Intention to Acquire OCs Over-The-Counter

This was the response variable of interest in the study. A scenario depicting a plausible situation for obtaining oral contraceptives OTC was built into different sections

of the questionnaire. This scenario described a new means for acquiring oral contraceptives, including the means that offered highest professional supervision (physician's prescription) and the means that offered least professional supervision (OTC). Subjects' response in intending to acquire OCs over-the-counter was then measured using a 5-point scale, with the scale values ranging from very likely (+2) to very unlikely (-2) it is that the person would intend to obtain oral contraceptives OTC. Larger values for behavioral intention represented stronger intentions for acquiring OCs over-the-counter.

Demographic and Other Variables

Table. 4.1 provides a list of demographic variables that were of interest to the study and their operationalization. These variables provided a description of the study sample. Subjects' age was measured as a continuous variable. In addition, the information about subjects' race, religion, duration of current use of OCs in months, plans to use OCs sometime in the future, and the type of health professional seen for OCs was obtained at the categorical level. This information was obtained for descriptive purposes only. The current reality indicated that women obtained their OCs and related services from professionals other than physicians. Therefore, it was a matter of interest to this study to get an idea as to the type of professional supervision involved in the acquisition of OCs among those who had used them in the past. Variables describing the current and past OC use were measured on a dichotomous scale. Categorical variables measuring insurance coverage for prescription and nonprescription drugs and also for MD visits were included in the questionnaire. The past or current use of OCs, if any,

reflected the level of experience women had with this form of contraception. Further, it was also a matter of interest to examine if there was any difference in OC intentions for women who had used oral contraception in the past and those who had not.

Instrument Development and Validation

A pilot test of the instrument was carried out first. This was to assess the reliability and validity of the instrument for further refinement before data collection. First, a panel of expert judges, comprising mainly the faculty of the Department of Pharmacy Health Care Administration, University of Florida, was requested to check the readability and face validity of the questionnaire. A group of graduate students and scholars at the department was also asked to review the scale for errors and, poorly worded, misleading or confusing items. Next, questionnaires were mailed to a sample of randomly selected female students enrolled in the University of Florida to identify any construction defects. Clarity and relevance of the items were assessed depending on the responses to different items in the questionnaire. This process was also expected to help identify problems in instructions, formatting, item wording and so on.

One of the primary objectives of this investigation was to develop and validate the OC-attitude scale. An exploratory factor analysis was conducted to verify previously identified domains on the scale pertaining to beliefs about risks and benefits of acquiring OCs, thus contributing to establishment of construct validity. Principal component analysis with varimax rotation was employed to look at the pattern of correlations among variables in a correlation matrix. Eigenvalues resulting from principal component analysis were identified to calculate communality estimates (proportion of multivariate

variance explained) of the orthogonal vectors. All factors achieving eigenvalues greater than 1.00 were retained. The resulting orthogonal factors were then subjected to varimax rotation to gain further insights. The goal here was to verify the existence of two subscales of behavioral beliefs (i.e., beliefs about risks and beliefs about benefits) which are conceptually reasonable and which have acceptable psychometric properties. The factor loadings of less than .30 were considered unimportant.

In addition, the internal consistency of the scales was calculated to estimate their reliability using Cronbach's alpha. Mean item and total score on the OC-attitude subscales were separately calculated. Partial alphas for each item were inspected and item-total correlations determined. An item analysis to determine item-remainder correlation was also performed. Items were considered for deletion if (i) the item to total correlation was less than .20, and (ii) the partial alpha indicated that the Cronbach's alpha would increase substantially if the item were deleted. Since our scale consisted of two previously identified dimensions, coefficient alpha for each dimension was calculated. Variability on responses and intercorrelation between items were also assessed. Items were retained in conceptually defined subscales depending on the correlation between items in that scale and also with items in other subscales. Thus, independent and internally consistent subscales were established for separate behavioral belief domains. The revised instrument was then used for the testing of hypotheses on the larger sample as detailed in the section following pilot study.

Pilot Study

The readability and face validity of the questionnaire was initially established by using a panel of expert judges consisting of faculty and graduate students at the department of Pharmacy Health Care Administration and experts at the departments of Pharmacy Practice and Foundations of Education. Next, the questionnaire was pilot tested among female students registered for summer semester at the University of Florida to identify construction defects. The records at the Office of the Registrar indicated that there were 12450 female students registered for the 1998 summer semester. 1000 female students were selected from the listing provided by the University Registrar's Office using systematic sampling technique. For this purpose, every 12th student from the list was drawn to obtain a sample of 1000 students (Agresti and Finlay, 1986). Since the primary aim of the pretest was to aid the evaluation and revision of the instrument, no reminder postcards or follow-up telephone calls were used. The questionnaires were mailed out to students' residential addresses on July 23, 1998.

The questionnaire was composed of an evaluation scale, a set of two likelihood scales (for physician and OTC sources respectively), a subjective norm scale, and items to measure intention to acquire OCs OTC and OCs in general. The evaluation scale sought to measure subjects' evaluation of the possible consequences of using oral contraceptives. As described in the previous section, the items included in the questionnaire represented beliefs about benefits and risks of using OCs. The two likelihood scales tested respondents' subjective probability (or perceived likelihood) of experiencing the listed consequences if OCs were acquired with a physician's prescription and OTC respectively. The subjective norm component of the instrument

consisted of normative belief and motivation to comply subscales. Furthermore, direct measures for both attitude toward the behavior and subjective norm were included in the questionnaire. In addition, items eliciting responses about subject demographics and OC-related experiences were also included in the test.

In two weeks following the initial mailout, 251 questionnaires were returned, constituting a response rate of 25 percent. Nine questionnaires were returned undelivered. Since the bulk mailing procedure was used in this step, there was no guarantee that the mail was forwarded to those students who had moved to a new address. The response rate for the pretest study was somewhat low probably due to the questionnaire being received during the final week of summer classes, and due to the bulk mailing service. The low response rate could also be attributed to the fact that there was no follow-up mailout of questionnaires or reminder cards for the pilot study. However, the sample obtained above was adequate for instrument validation. Excel 97 (SR-1) was used to set up a spreadsheet database of responses. SPSS (Release 7.0) and JMP IN (Version 3.02) statistical programs were used to run statistical analysis on the data imported from Excel.

Table 4.3 describes the pretest sample. The mean age of the sample was 24 years. Of the total sample, about 48% were 21 years or under, 42% were between the ages of 22 and 31. 50% of the sample reported the current use of OCs, while 78% of the sample reported having used OCs in the past. About 54% of those who used OCs used them for two years or more, 23% used them for more than a year, and about 19% had used them for only a few months. About 67% of those who are currently using OCs, or those who used them in the past, saw a physician first for OC prescription, while about 31% saw nurse practitioners first for their OCs.

Table 4.3 Pretest Sample Characteristics

| Sample Characteristics* | Percent | Mean/Std. dev |
|---|---------|---------------|
| Age | | |
| Minimum | -- | 24 yr/6.7yr |
| Maximum | | 17yr 60yr |
| Race | | |
| African American | 7.1 | |
| White | 77.0 | |
| Asian American | 1.8 | |
| Hispanic/Latina | 9.7 | |
| Other | 4.4 | |
| Religion | | |
| Protestant | 29.1 | |
| Catholic | 31.5 | |
| Jewish | 7.5 | |
| Other | 31.9 | |
| Possible OC use in the future | | |
| No | 24.1 | |
| Yes | 41.1 | |
| I don't know | 34.8 | |
| Insurance for MD visits | | |
| Yes | 78.9 | |
| No | 16.7 | |
| I don't know | 4.4 | |
| Insurance for Rx and NonRx drugs | | |
| Yes | 68.0 | |
| No | 26.3 | |
| I don't know | 5.7 | |
| Intention to acquire OCs OTC | | |
| Mean | -- | -0.03/1.6 |
| Very likely (intenders) | 26.9 | |
| Somewhat likely (intenders) | 18.1 | |
| Neutral | 7.9 | |
| Somewhat unlikely (non-intenders) | 19.4 | |
| Very Unlikely(non-intenders) | 27.8 | |
| Intention to use OCs | | |
| Mean | -- | 1.21/1.27 |
| Very likely | 63.0 | |
| Somewhat likely | 17.2 | |
| Neutral | 6.6 | |
| Somewhat unlikely | 4.4 | |
| Very Unlikely | 8.8 | |

*N= 251

The instrument validation was achieved by first performing the factor analysis and then by the estimation of internal consistency. The confirmation of the presence of

two previously conceptualized domains, namely, beliefs about benefits and beliefs about risks, within the evaluation and likelihood subscales was the reason for performing factor analysis first. The factor analysis was also performed to establish construct validity of the theory of reasoned action by confirming the presence of two constructs, namely, attitude toward the behavior and subjective norm, conceptualized by the model. Following factor analysis, reliability estimation for each of the subscales previously identified by the factor analysis was done. The section below describes the analytical procedures used to validate the instrument.

Construct Validation

Primarily, construct validity of the study instrument was established by two methods: 1) Factor Analysis, and 2) Correlation statistics. Construct validity of the instrument is determined by examining the extent to which the measures correlate with other measures designed to measure the same thing, and whether these measures behave as expected (Churchill, 1979). If the proposed relationships among the TRA model constructs are confirmed as predicted by the theory, both the constructs and the instrument that measure them are said to be valid (Crocker and Algina, 1986). With regard to correlational studies, Crocker and Algina (1986) state that there are no generally recognized guidelines for what constitutes adequate evidence of construct validation. However, correlations computed between measures that are appropriate and conceptually reasonable served as evidence of construct validity of the study instrument. For example, significant correlations between directly measured subjective norm and attitudes, and

their indirectly measured counterparts expected to provide evidence of construct validation.

Factor analysis

Factor analysis was one of the procedures used in this analysis for construct validation of the instrument. The factor extraction procedure employed principal component analysis for initial unrotated factor solution. Then an orthogonal rotation procedure (Varimax) was used to examine rotated, uncorrelated factors. Factor extraction procedures were employed on data obtained for all the variables representing the TRA model constructs. Specifically, the summated, multiplied products of evaluation and likelihood items (i.e., $\Sigma e_i b_i$) represented the attitude toward the behavior variable. These items were expected to reveal the presence of two subsets of items representing beliefs about benefits and beliefs about risks. Next, the items representing indirectly computed subjective norm (i.e., $\Sigma n_b X_{mc}$), obtained by multiplying normative belief and motivation scores, were also included in the analysis. The expectation here was that the subjective norm component in the factor analysis would account for the extraction of a separate factor, representing three sources of influence--family, partner, and friends. Results of the analysis are summarized in the following section.

Following the rule of thumb of at least 5-10 subjects per item (Cone and Foster, 1995; Gorusch, 1983; Nunnally, 1967), the sample size of 251 obtained was considered adequate to perform factor analysis. Table 4.4 presents a 3-factor solution, describing factor loadings for all the items representing the constructs from the TRA. The pattern exhibited by the factor loadings was as predicted by the theory. The analysis procedure

extracted three factors having eigenvalues of 2.3, 1.9, and 1.6 respectively, while the rest of the factors recorded eigenvalues of less than 1. Furthermore, the factor structure derived from the analysis confirmed the presence of two domains within the attitude component of the model (beliefs about benefits and beliefs about risks), as conceptualized by the investigator. The Scree plot further confirmed the existence of three prominent factors within the TRA instrument.

All the items on the 'beliefs about benefits' subscale (convenience, avoidance of unplanned pregnancy, regulation of menstrual cycle, and emergency contraception) loaded on the first factor. Each of these items had a factor loading of 0.5 or higher. Similarly, all the items on 'beliefs about risks' subscale (nausea, breast cancer, weight gain, and pain in the legs) loaded on Factor 2, with the exception of 'Personal expenditure' item.

Table 4.4 Rotated Factor Matrix for the TRA Constructs

| | FACTOR 1 | FACTOR 2 | FACTOR 3 |
|-------------------------|---------------|---------------|---------------|
| Nausea | .61385 | -.08133 | .16549 |
| Wgt Gain | .70862 | -.16204 | .00534 |
| Leg Pain | .81241 | -.04047 | .02081 |
| Br Cancer | .72666 | .16521 | -.02088 |
| Pregnancy | .00021 | .72025 | -.10991 |
| Mens Cycle | -.14858 | .71711 | .18198 |
| Mornng-aft-pil | .12342 | .53696 | -.12751 |
| Convenience | -.12894 | .66317 | -.00381 |
| Expenditure | .01066 | -.41023 | -.06166 |
| NBXM _C Emly | .19801 | .02813 | .80271 |
| NBXM _C Frnd | -.09522 | -.10072 | .79779 |
| NBXM _C Prtnr | .05896 | .05874 | .58664 |

Factor 1: Beliefs about risks (individual cXb), Factor 2: Beliefs about benefits (individual cXb), Factor 3: Subjective norm (individual nXb).

Further examination of factor loadings indicated that this item loaded heavily on a fourth factor by itself (0.88), with the factor eigen value of 0.9. It appears that 'personal expenditure' works as a separate factor. Furthermore, commonality estimates for this item and other items in both the subscales did not suggest a need for removal of any item.

In sum, the factor structure above confirmed the presence of two domains within the 'attitude toward acquiring OCs OTC' component. It also empirically verified the presence of the other dimension conceptualized by the TRA--subjective norm. Almost all the items loaded strongly (factor loadings of 0.6 or greater) on the corresponding factors. The item involving 'personal expenditure' appeared to be somewhat problematic. A separate, independent factor was found to correlate highly with this item, however, with a factor eigenvalue of less than 1. This further suggested that 'personal expenditure' item worked as a separate factor by itself.

As a further evidence of construct validity, Pearson correlation coefficient was computed for a bivariate association between a) directly and indirectly measured subjective norm variables, and b) directly and indirectly measured attitude variables. A correlation of 0.130 that is significant at the 0.05 level was obtained for the former, while a significant correlation of 0.385 at 0.01 level was obtained for the latter. This further confirmed both the construct and predictive validity of the TRA, as proposed by the model proponents.

Reliability Estimation

Following the confirmation of the conceptualized domains within the TRA instrument, the internal consistency for each subscale was then determined. First,

Cronbach's alpha was computed for two subscales within the evaluation component of the instrument. Next, a similar analysis was conducted for the likelihood (OTC) scale and subjective norm (indirect measure) component of the scale. The consistency with which the subjects performed across items measuring the same construct was obtained by calculating coefficient alpha. A positive contribution to internal consistency of the subscale was one of the criteria considered for retaining the items in the analysis. The evaluation component of the attitude scale consisted of two subscales: I) beliefs about risks and, II) beliefs about benefits of using oral contraceptives. The internal consistency for both subscales of the evaluation scale is presented in Table 4.5 and Table 4.6.

Table 4.5 Item-Total Statistics (Evaluation of Benefits Subscale)

| Benefit items | Corrected item-total correlation | Alpha if item deleted |
|----------------------------|----------------------------------|-----------------------|
| Convenience | .5503 | .5063 |
| Emergency Contraception | .3557 | .6563 |
| Regulation of menstr cycle | .4283 | .5844 |
| Avoidance of pregnancy | .4470 | .5854 |

Alpha = .6501

Table 4.6 Item-Total Statistics (Evaluation of Risks Subscale)

| Risk items | Corrected item-total correlation | Alpha if item deleted |
|----------------------|----------------------------------|-----------------------|
| Breast Cancer | .3350 | .5935 |
| Personal Expenditure | .1153 | .6958 |
| Nausea | .4249 | .5482 |
| Pain in the legs | .5168 | .5001 |
| Weight Gain | .5446 | .4803 |

Alpha = .6260

Note: These items were reverse scored to reflect beliefs about risky consequences of using OCs

Table 4.7 Item-Total Statistics (With 'Personal Expenditure' Item Removed)

| Risk items | Corrected item-total correlation | Alpha if item deleted |
|------------------|----------------------------------|-----------------------|
| Breast Cancer | .3359 | .7134 |
| Nausea | .4722 | .6410 |
| Pain in the legs | .5724 | .5750 |
| Weight Gain | .5568 | .5835 |

Alpha = .6978

Table 4.8 Item-total Statistics (Normative Belief Subscale)

| Sources of influence (normative belief) | Corrected item-total correlation | Alpha if item deleted |
|---|----------------------------------|-----------------------|
| Family | .8265 | .8398 |
| Partner | .8140 | .8509 |
| Friends | .7739 | .8829 |

Alpha = .9008

Table 4.9 Item-Total Statistics (Motivation to Comply Subscale)

| Sources of influence (motivation to comply) | Corrected item-total correlation | Alpha if item deleted |
|---|----------------------------------|-----------------------|
| Family | .5266 | .5265 |
| Partner | .4323 | .6494 |
| Friends | .5107 | .5554 |

Alpha = .6743

A similar analysis was also performed on the likelihood (OTC) subscale of the instrument. Tables 4.8 and 4.9 report the internal consistency for normative belief and motivation subscales of the subjective norm component of the instrument. An acceptable level of alpha of 0.50 to 0.60 (Nunnally, 1967) was used for retaining or eliminating the items. Given these cut-offs, none of the subscales seemed too problematic. Table 4.10 summarizes the information on internal consistency for different subscales of the study instrument. The alpha for all the subscales were found to be greater than or equal to 0.60.

To further determine instrument reliability, two parameters were examined through item analysis. First, item-to-total correlation was examined. Next, inter-item correlation for each subscale was examined to validate the results of item analysis. Item analysis – a computation and examination of any statistical property of respondents' response to an individual item (Crocker and Algina, 1986) – was employed to identify the final set of items for each dimension of the instrument. The parameter employed for this purpose is called item reliability index.

Table 4.10 Reliability Estimates of Pretest Subscales

| Subscale | Number of Items | Reliability |
|--|-----------------|-------------|
| Evaluation Component | | |
| Beliefs about benefits | | |
| Beliefs about risks | 4 | 0.65 |
| Beliefs about risks (minus 'personal expenditure') | 5 | 0.62 |
| | 4 | 0.69 |
| Likelihood Component | | |
| Beliefs about benefits | | |
| Beliefs about risks | 4 | 0.62 |
| Beliefs about risks (minus 'personal expenditure') | 5 | 0.74 |
| | 4 | 0.82 |
| Subjective norm component | | |
| Normative beliefs | | |
| Motivation to comply | 3 | 0.90 |
| | 3 | 0.68 |

According to Crocker and Algina (1986, p.320), item reliability index is the parameter that should be used in lieu of the simple correlation between item and criterion because the item variance actually weights the relative contribution of a particular item to overall test score reliability. Consequently, the correlation between item score and the total score was examined in this analysis. The corrected item-to-total correlation was calculated to correct the spurious value that results when item score contributes to the total score. Thus, it is the correlation between an item score and the total of the

remaining items. Some researchers (Zaikowski, 1985; Shimp and Sharma, 1987) advocate a corrected item-to-total correlation of 0.50 or greater as a rule of thumb for retaining an item in its subscale. For the benefit subscale of the evaluation component of the questionnaire, three items correlated less than 0.50 with the assigned subscale (Table 4.5). Three items of the risk subscale of the component had correlations less than 0.50 with the assigned subscale (Table 4.6). However, normative belief subscale of the instrument had all the item-to-total correlations of greater than 0.50 (Table 4.8), while the motivation subscale had only one item that correlated less than 0.50 with the assigned subscale (Table 4.9). Each of these subscales is described in detail below.

Beliefs about benefits subscale. Table 4.5 shows that three items had correlations under 0.5. These items had correlations of 0.35, 0.42, and 0.44 respectively. These items were not considered problematic, however, for two reasons. First, removal of these items would have lowered the reliability considerably. Second, the measured correlations were not sufficiently low to render them useless. Instead, all the three items were found to be moderately correlated with the total score. However, the second item (emergency contraception), having the lowest correlation, seemed to be in need of revision. It appears that the concept of morning-after-pill as emergency contraception is perhaps not well understood by the respondents. In addition, deletion of this item from the subscale did not seem to influence reliability estimates much. However, revision of this item, rather than deletion, seemed to be the more appropriate step in instrument validation. Furthermore, this step seems necessary given the importance this item has for OC

use OTC and for its practical implications. It is expected that all these items would perform better in the main study involving a larger sample.

Beliefs about risks subscale. Of the three items that had less than 0.50 correlations, only item 2 (personal expenditure) had a poor correlation with the total (0.11). This was consistent with our previous findings about the item performance during the factor analysis. The lower correlation could be attributed to the possibility that the item 'personal expenditure' worked as a separate factor. It did not seem to belong to the risk subscale. As a further check, the variance of this item in relation to other items in the subscale was also examined. From the variance stand point, the item did not look problematic. The item variance was found to be comparable to all the other items in the subscale.

Motivation to comply subscale. Only one item (Partner) had a correlation of less than 0.50. However, the correlation of 0.43 for this item is acceptable for three reasons. First, the correlation of 0.4 is sufficiently high to justify its retention in the subscale. Second, this item is expected to perform better with a larger sample. Third, it is logical to believe that major decisions involving contraception receive substantial input from partners, whereas inputs from friends and parents may not receive much weight. This is particularly so in the case of OC acquisition, where input from a partner might have received considerable weight. For this reason, it can also be argued that the perceptions about what a partner might think about acquiring OCs OTC--and hence the motivation to comply with partner's wishes--may be somewhat skewed, thereby reducing item variance. Such perceptions may also be in conflict with similar perceptions regarding what friends and family

might think about buying OCs over-the-counter. A closer examination of the response to this item also revealed that almost all the women in our sample responded to this question (i.e., 99.9% item response), indicating that all the women who responded to the questionnaire did in fact have a partner who they could think of at the time of survey. Thus, this item was retained in the instrument.

Inter-item correlations for each subscale revealed that almost all the inter-item correlations were greater than 0.30. As a further evidence of internal consistency, correlation coefficients were computed for the two items that sought to directly measure attitude toward acquiring OCs OTC (section VI, items 2 and 3 on the instrument). A two-item measure of attitude toward acquiring OCs OTC was incorporated in the study instrument, with the mean of both items being used for data analysis. These items were found to correlate very highly (0.918) with each other at the 0.01 level.

Conclusion

Overall, the study instrument was found to be reliable and valid. Only two items were found to be problematic. 'Personal expenditure' and 'emergency contraception' items appeared to be in need of further examination. In experts' opinion, further revision of these items was not necessary because it was believed that any revision would result in little change in the factor structure of the instrument. A substantial item-to-total correlation (0.3557) and a reasonably strong factor loading (0.54) for the 'emergency contraception' item indicated that this item did not perform poorly. While the removal of the item on 'emergency contraception' from the benefit subscale would not have enhanced

the reliability considerably, the same was not the case with the 'personal expenditure item.' In fact, the results showed that the removal of this item from the risk subscale resulted in better reliability for the risk subscale (Table 4.7). Therefore, the consensus among the experts regarding the 'personal expenditure' item was that it did not belong to the risk subscale. Given the importance this item had for the OC acquisition OTC, the item was retained in the instrument, with the understanding that it worked as a separate factor by itself. The rest of the items did not seem to need any revision. A larger sample to be employed in the main study may in fact result in better item performance. Therefore, no further changes were made to the instrument. The main study and hypotheses testing were then conducted with the same instrument.

Sample Selection

The list provided by the Office of the Registrar at the University of Florida served as the sampling frame for the main study. A list of all the female students registered for the Fall 1998 semester was obtained. The actual sample size needed to test the research hypotheses was determined using three different methods. The strategy to analyze the data basically involved the use of multiple regression analysis. According to one estimate (Green, 1991), for studies involving multiple regressions, the minimum sample size could be determined as follows. The minimum sample size is estimated as a function of the effect size as well as the number of predictors to be used in the prediction of the dependent variable (Green, 1991). Based on this methodology, the minimum sample size (N) required to evaluate multiple correlation coefficients is $= L/F2$, with a power of 0.80 ($\alpha=.05$).

Here $L = 6.4 + 1.65m - 0.05m^2$ (m = number of predictors)

and $F^2 = R^2 / (1 - R^2)$ (R^2 = Effect size)

For effect size calculation, a regression analysis was performed on the pilot study sample. Multiplicatively derived measures of attitude toward the behavior and subjective norm were taken as independent variables. Intention to acquire OCs OTC was used as the dependent variable. An R Square value of 0.101 was obtained for the pilot study sample. A similar regression analysis was also performed with the directly measured constructs of attitude and subjective norm as the independent variables for the second regression equation. An R Square value of 0.599 was obtained as a result of this analysis. Thus, using Green's formula, the required sample size was calculated based on both of the R Square values to determine a possible range of sample sizes needed to run the data analysis. Given that the minimum effect size obtained was .10, and the maximum number of predictors on which behavioral intention was regressed was 2, the minimum sample size required for this study was found to be 85. A similar sample size estimate based on the second regression equation was about 10.

Secondly, given also that the study design involved considerable use of correlational statistics, according to another estimate, a sample size of about 15 – 45 was considered adequate for r values ranging from .3 to .5 at 0.05 level of statistical significance (Garrett, 1966) involving bivariate relationships. These values were taken directly from the table listing the estimates of sample size required to obtain desired coefficients of correlation significant at alpha of .01 and .05, for a given number of variables (see p 201, 437). Thirdly, the sample size estimation based on a computer program "STPLAN" required that we use a sample of 126 subjects to detect a difference

between .00 and .30 at $\alpha=0.05$ and power=0.80. Thus, given different estimates above, a sample size of about 130 subjects was considered adequate for the main data analysis.

Data Analysis

The data analysis was conducted in three steps. The first step involved reestimation of the internal consistency reliability of the OC-attitude scale. The second step assessed non-response bias for those who failed to respond to the survey. The third and the final step involved the testing of study hypotheses and research questions.

Reliability Reestimation

The internal consistency of each subscale within the OC-attitude scale was reexamined using Cronbach's alpha. As before, inter-item correlations and item-to-total correlations for the benefit and risk subscales were examined. In addition, coefficient alpha was also computed for evaluation subscales, likelihood subscales, normative belief subscale, and motivation subscale.

Non-Response Bias Estimate

The non-response analysis mainly consisted of the review of reasons for refusal. As discussed in the previous section, the survey research was completed in two steps: the first step involved the mailing of the questionnaire, whereas the telephone follow-up constituted the second step. The personnel at the survey center recorded the reasons for refusal to participate in the study by those subjects who were contacted over the phone

and did not wish to respond to the survey. Specific reasons nonrespondents did not mail back their survey were also explored.

Hypothesis Testing

The research questions developed in the study basically involved the prediction of women's intention to acquire birth control pills over-the-counter. Since the majority of the research variables were measured on interval scales (see Table 4.1), the hypotheses testing and research questions in this study were addressed primarily by using parametric statistics like multiple regression analyses and by using association statistics.

Restated, the first research question was:

1. What is the predictive power of attitude toward acquiring OCs over-the-counter in the prediction of a woman's intention to acquire OCs over-the-counter in a hypothetical situation where such acquisition is legal?

The first research hypothesis, written in support of this question, essentially dealt with the model's ability to predict behavioral intention and it was the hypothesis of major interest to the study.

H1: A woman's intention to acquire oral contraceptives over-the-counter may be predicted from (a) her attitude toward acquiring them OTC and (b) her normative beliefs, weighted by her motivation to comply with those perceived norms.

In this research hypothesis, the intention to acquire oral contraceptives over-the-counter was thought to be predicted by a person's attitudes toward acquiring OCs over-the-counter and her subjective norms regarding the same, both derived as multiplicative products (Σb_{ie} or OC-attitude, and ΣNb_{Mc}). Multiple regression analysis was

performed to test this hypothesis. The variance explained by the predictors on the dependent variable was calculated, and tests for significance of regression coefficients was performed at $\alpha = 0.05$. Standard error, betas, R-square values, and p were reported.

The second research question is restated as follows. There was no formal hypothesis proposed in support of this question.

2. What are the beliefs that will describe the differences in intention between women who intend to acquire oral contraceptives over-the-counter and those women who do not?

This research question dealt with the assessment of the difference in beliefs between those who intended to acquire OCs over-the-counter and those who did not. In addition, this question was also expected to address the appropriateness of the TRA for women who had high behavioral intention (BI) scores versus those who had low intention scores. Other researchers have found differences in the model when looking at “intenders” versus “nonintenders” (Moore et al., 1996; Jaccard and Davidson, 1972). The dual objectives stated above was met by classifying women as belonging to one of the two groups: “intenders” and “nonintenders.” Then beliefs and attitudes held by these women regarding the acquisition of OCs over-the-counter was compared across two groups. Women who indicated that it was at least slightly likely that they would intend to acquire OCs over-the-counter (i.e., intention scores of 1 and 2) were classified as “intenders.” Those who indicated that they were, to some degree, unlikely to acquire the pill OTC (i.e., intention scores of -1 and -2) were classified as “nonintenders.” Subjects who responded in “neutral” (i.e., intention score of 0) were dropped from the analysis.

First, the mean attitude scores--both indirectly and directly measured--for the two groups were computed and compared using t-test. Similar comparison between groups was made on their direct and indirect subjective norm scores. MANOVA, a statistical method that uses a simultaneous comparison of multiple means (Stevens, 1992; Morrison, 1967) was employed to examine the existence of any overall differences in beliefs between groups. This method computed simultaneous confidence intervals comparing the difference between means on the evaluation scores, likelihood scores, normative beliefs, and motivation to comply variables for those who intended to acquire OCs over-the-counter and those who did not. Then, individual mean scores on beliefs multiplied by evaluations (i.e., $EiXB_i$), normative beliefs multiplied by motivation scores (i.e., $NbXM_c$), for two groups were computed and individual means were compared to further explore the differences between groups. The analysis of belief this way provided additional insights into variations of intentions.

The third research question is restated as follows.

3. Are attitudes regarding perceived risks and benefits of acquiring OCs over-the-counter predictive of a woman's intention to acquire them OTC?

The following hypothesis was proposed in support of this question.

H2: There will be a positive correlation between favorable attitudes associated with the use of OCs acquired OTC and intentions to acquire OCs through that means.

Computing a Pearson Product Moment Correlation Coefficient tested this hypothesis. This coefficient calculated the association between attitudes measured indirectly (i.e., OC-attitude; Σb_{iei}) and intention to acquire OCs over-the-counter. More

over, a similar correlation computed with the direct measure of attitude (general attitude; A-act) provided further confirmation of the hypothesis. In addition, this question also sought to investigate the relationship between two belief components (i.e., beliefs about risks and beliefs about benefits) on the OC-attitude scale and the directly measured general attitude (A-act). Computation of correlation coefficients between these measures provided further insights into the relationships between beliefs and any favorable or unfavorable attitudes.

The fourth research question addressed a woman's perceptions of general social expectations regarding the behavior as a function of the person's set of beliefs about what significant other people wanted the person to do. It is stated as follows:

4. What is the relationship between a woman's subjective norm, including motivation to comply with the expectations of her significant others, and her intention to acquire OCs over-the-counter?

The following hypotheses were proposed to address this question.

H3: Perceptions of the wishes of other people, weighted by the woman's motivation to comply with those wishes, will be related to a woman's intention to acquire OCs over-the-counter.

H4: The directly measured perceptions of subjective norms more supportive of OC acquisition over-the-counter will be associated with stronger intentions to acquire OCs over-the-counter.

Computing Pearson correlation coefficients for hypothesized bivariate relationships between variables primarily tested the hypotheses H3 and H4. The testing of H3 involved the computation of a correlation coefficient between the indirectly

derived (multiplicative) measure of subjective norm ($\Sigma NbMc$) and behavioral intention score. A similar statistic computed for H4 determined the degree of association between the directly measured subjective norm and behavioral intention score. While H4 is conceptually not different from H3, it was expected to provide insights into the effect of each individual referent (family, friend, or partner) on behavioral intention.

The fifth research question addressed the relative contribution of attitudes and subjective norms in predicting intentions to acquire OCs over-the-counter. No formal hypothesis was presented in support of this research question as there were no well-established research findings or hypotheses existing in the literature that were specific to the study population.

5. What is the relative contribution of attitudes and subjective norms in predicting intentions to acquire OCs over-the-counter?

A comparison of the magnitudes of the standardized regression coefficients resulting from the testing of the first research hypothesis above was expected to suggest the relative contribution of two components in the prediction of intention.

Finally, descriptive statistics on age, race, religion, etc. were calculated. The frequency data were reported for all the variables measured at a categorical level, such as race, religion, level of education, marital status, past use of OCs, current use of OCs duration of OC use, insurance coverage, plans to use OCs in the future, and type of health professional seen for OC prescription.

Limitations

This study has several limitations. One of the inherent limitations was the inability to measure the ultimate behavior (i.e. actual acquisition of OCs without a prescription) in question. Obviously, the current regulatory atmosphere would not permit the sale of oral contraceptives over-the-counter. Therefore, the behavior in question could not be observed in the current health care environment. However, the measure of intention to perform the behavior was expected to alleviate this problem to some extent. Another limitation of the study was that the study population came mainly from a university campus, the majority of which is comprised of young adults. For this reason the study findings may not be very generalizable (i.e., external validity) to a larger, more diverse female population. Yet, these findings may be useful since they provided insights into OC decision making by young adults, a segment of the population which policy makers are most concerned about for its potential to augment efforts to reduce the teenage pregnancy problem in the US. Another major problem with a study of this nature was the issue of social desirability. Contraception has been a subject of controversy for many years. The subject matter also has implications for abortion, morality, religiosity etc. Therefore, it was possible that subjects' response to some of the questions was biased or influenced mainly by the social desirability. Finally, the dependent variable and other measures were obtained through self-reports and were perhaps biased by response sets, acquiescence (tendency to agree) and extremity (tendency to use extreme ratings). These factors may have further obscured our measurement of variables.

Summary

This chapter reviewed methodology for the study of intention to acquire OCs over-the-counter among university female students using the theory of reasoned action. This chapter also discussed the reliability and validity of instruments and other measures of key variables. This study primarily relied on self-reporting of intention and used a cross-sectional study design. The entire project involved multiple stages, including instrument development, pilot testing of the instrument, mailing of the written questionnaire and conducting the follow-up telephone administration. The analysis strategy included description of frequencies of responses, the examination of relevant bivariate relationships and descriptive data, MANOVA, as well as multiple regression to evaluate the usefulness of the TRA. The chapters that will follow will present a detailed presentation of the results of the analysis, and discussion and interpretation of these results, including their implications for the theory and for future research.

CHAPTER 5

RESULTS

Introduction

This chapter presents the results of the data analysis in four sections. The first section describes the results of nonresponse analysis. The second section presents an overview of the sample characteristics and subjects' responses to crucial study variables in the survey instrument. This section also examines the possible inequality in responses to survey items resulting from the two survey methods (mail and telephone) that were employed in the study. The third section includes examination of the reliability of the OC attitude scale. The final section presents the results of test of the model, followed by the results of multiple regression, MANOVA, and correlation analyses. Also, in this section, results of collinearity diagnostics, residual tests for violation of assumptions for regression, diagnostics to check violations of assumptions for MANOVA, along with the results for testing of exploratory questions are presented.

Response to Survey

On September 16, 1998, questionnaires were mailed out to a sample of 500 randomly selected female students enrolled for the Fall semester at the University of Florida. Of the 500 questionnaires, 469 were deliverable, with 31 undelivered returns. During the mailing process, of the 469 addresses that were usable, 20 students had moved

out of town, and some out of state. The forwarding addresses for these students, provided by the US Postal Service, indicated that they either no longer lived on campus or lived in a location that was not commutable from the campus on a daily basis. Thus only 449 addresses were considered usable. 48 of the 449 students had changed their addresses during the mailout process. Since the bulk mailing services provided by the USPS did not include forwarding services, questionnaires were sent separately to these 48 students at their new address approximately 10 days after the initial mailout. Reminder postcards were sent to nonresponders on September 30, 1998. 13 questionnaires were resent to those who contacted the investigator indicating that they either did not receive the questionnaire or had misplaced/lost them. 8 postcards were returned undelivered. It was assumed that some students had changed their addresses again. Since it was not possible to keep track of these changes, the final effective number of usable addresses was assumed to be 449.

Of the 449 questionnaires that were assumed to be delivered, 188 were returned. However, one questionnaire was blank, and two students returned a wrong survey that was being conducted by a campus hospital. Thus, there were 185 usable responses to the initial mailout of questionnaires (41%). The second stage of the survey process involved placing telephone calls to those who did not respond to the initial mailing of the survey. During the first week of November, 1998, telephone calls were placed by the personnel at the University of Florida Survey Center to the nonresponders. The telephone numbers of subjects was obtained from the campus Registrar's office and was provided to the Center by the investigator. A list of approximately 300 names of the nonrespondents was provided to the survey center. There was no telephone listing available for all the

students on the list. Therefore, follow-up calls were made only to 236 students who had provided their telephone numbers to the Registrar's office. Callsheets were maintained by the personnel of the center listing all the follow-up activities. Table 5.1 shows the details of follow-up procedure adopted by the survey center. The Center was successful in administering the questionnaire to 109 nonresponders from a list of about 300 students (approximately 36%). The survey was completed on November 6, 1998. Combining the survey completions from both written and telephone administration resulted in a total of 294 usable responses, for a final, cumulative response rate of 66%. There were 4 late returns that were not included in the analysis.

Table 5.1: Callsheets for Telephone Administration of the Survey

| | |
|--------------------|------------|
| 3 Attempts | 88 |
| Refusals | 40 |
| Language barrier | 0 |
| Non-working* | 72 |
| Business | 5 |
| Miscellaneous | 0 |
| Terminations | 0 |
| Completions | 109 |

*Includes numbers that have been disconnected and as well as people no longer at the telephone number listed.
N = Approx. 300

Non-Response Analysis

An overall response rate of 66% was considered to be adequate. However, attempts were made during the telephone interviews to gather reasons for refusal. During the telephone interview those subjects who did not wish to respond to the survey questions were asked to site reasons for not returning the mail questionnaire or completing the survey on the phone. The reason most commonly given by the students

for not returning the questionnaire was “Too busy, I did not have time to complete it.” Table 5.2 provides a list of reasons cited by the nonrespondents to the survey. None of the reasons listed below indicated that there was bias among the nonrespondents regarding their possible responses to the dependent variable on the study instrument. Thus, even though a systematic comparison of nonrespondents’ response to the dependent variable with that obtained from the respondents was not possible, bias in their response that may relate to survey results was not evident.

Table 5.2: Reasons for Refusal

| |
|---|
| Does not give information over the phone |
| Graduate student.....do not have time to complete survey |
| Didn't like the questions on the survey |
| Too busy.....law student |
| Not interested |
| Thinks the survey is bad.....thinks the idea of a survey is bad. |
| Does not take birth control pills |
| Didn't remember receiving the survey in the mail..... will not do it over the phone |
| Too busy..... work full-time and go to school full-time |
| Too difficult to understand. |

Characteristics of the Study Sample

Descriptive Data

The final sample was made up of 294 individuals who lived in the Gainesville area and on campus at the University of Florida. Characteristics of the sample are specified in Table 5.3. The mean age of the sample was 25 years. Of the total sample, about 45% were 21 years or under, 40% were between the age 22 and 30, and about 10%

were between the age 31 and 40. 45% of the sample reported current use of OCs, while 78% of the sample reported having used OCs in the past. About 66% of those who were currently using OCs used them for two years or more, 19% used them for more than a year, and about 15% had used them for only a few months. About 64% of those who were currently using OCs saw a physician first for their OC prescription, while about 35% saw nurse practitioners first for their OCs. Of the 162 who said they were not currently using OCs, about 43% indicated that they would consider using them sometime in the future. When asked, "How likely is that you would decide to use birth control pills at all from among other forms of contraception?" about 75% indicated that they were "very likely" or "somewhat likely" to use birth control pills in the future.

Examination of women's intention to acquire OCs over-the-counter revealed that about 163 (56%) of the respondents were "very unlikely" or "somewhat unlikely" to acquire them OTC. 109 (37%) indicated that they were "very likely" or "somewhat likely" to acquire them OTC if they were sold over-the-counter, whereas 21 (7%) of the respondents remained undecided on this issue.

Analysis of Study Variables

Table 5.4 lists the means and standard deviations for all the crucial variables in the study instrument. For the evaluation scale, higher scores represented higher degree of importance subjects placed on the consequences of using birth control pills. The scale values ranged from +2 (very important) to -2 (very unimportant).

Table 5.3 Final Sample Characteristics

| Sample Characteristics* | Frequency (N = 294) | Missing values | Percent |
|-----------------------------------|------------------------|-------------------|---------|
| Age | | 2 | |
| 18 - 21 Years | 131 | | 44.5 |
| 22 - 30 Years | 117 | | 39.7 |
| 31 - 40 Years | 32 | | 10 |
| Race | | 3 | |
| African American | 17 | | 5.8 |
| White | 239 | | 81.3 |
| Asian American | 9 | | 3.1 |
| Hispanic/Latina | 19 | | 6.5 |
| Other | 7 | | 2.4 |
| Religion | | 24 | |
| Protestant | 68 | | 25.2 |
| Catholic | 74 | | 27.4 |
| Jewish | 27 | | 10.0 |
| Other | 101 | | 37.4 |
| Current OC use | | 1 | |
| Yes | 133 | | 45.4 |
| No | 160 | | 54.6 |
| Current OC use—duration** | (N=133)** | | |
| A few months | 20 | | 15.0 |
| More than a year | 25 | | 18.8 |
| Two years or more | 87 | | 65.4 |
| Possible OC use in the future* | (N=160)* | | |
| No | 47 | | 29.0 |
| Yes | 69 | | 43.1 |
| I don't know | 44 | | 27.5 |
| OC use in the past | | | |
| Yes | 229 | | 77.9 |
| No | 65 | | 22.1 |
| Insurance for MD visits | | 1 | |
| Yes | 222 | | 75.8 |
| No | 57 | | 19.5 |
| I don't know | 14 | | 4.8 |
| Insurance for Rx and NonRx drugs | | | |
| Yes | 179 | | 60.9 |
| No | 92 | | 31.3 |
| I don't know | 23 | | 7.8 |
| Professional seen for OCs** | (N=133)** | | |
| Doctor | 85 | | 63.9 |
| Nurse Practitioner | 46 | | 34.6 |
| Midwife | 1 | | 0.8 |
| Other | 1 | | 0.8 |
| Intention to acquire OCs OTC | | 1 | |
| Very likely (intenders) | 70 | | 23.9 |
| Somewhat likely (intenders) | 39 | | 13.3 |
| Neutral | 21 | | 7.2 |
| Somewhat unlikely (non-intenders) | 66 | | 22.5 |
| Very Unlikely(non-intenders) | 97 | | 33.1 |
| Intention to use OCs | | 2 | |
| Very likely | 168 | | 57.5 |
| Somewhat likely | 52 | | 17.8 |
| Neutral | 20 | | 6.8 |
| Somewhat unlikely | 24 | | 8.2 |
| Very Unlikely | 28 | | 9.6 |

* Among those who are currently **not** using OCs

** Among those who are currently using OCs

Similarly, for the two likelihood scales (OTC and physician respectively), higher scores represented the higher perceived likelihood that respondents thought the listed consequences had of occurring while using oral contraceptives acquired OTC, and with a physician's prescription respectively. For the likelihood scales, the scale values ranged from +2 (very likely) to -2 (very unlikely). Therefore, a measure of attitude toward the behavior that was derived indirectly had a range of -36 to +36 as summated product values for 9 items. Means and standard deviation values are also reported on individual (evaluationXbelief) product for each of the 9 items. A similar scale was used for measuring normative beliefs and subjective norm perceptions of the respondents. A possible range of scores for this subscale was -12 to +12.

In addition, Table 5.4 also lists means and standard deviations for directly measured attitudes and subjective norm. Mean and standard deviation values for attitude toward benefits and attitude toward risk components is also listed in the table. These two attitude scores were computed by multiplying the four evaluation scores making up both risk and benefit subscales by respondents' likelihood scores, with a possible range of -16 to +16. More positive scores for the benefit items indicated more favorable attitude toward the benefits of using OCs. Similarly, more negative scores for risk items indicated less favorable attitude toward the risky consequences of using OCs. Further, the multiplicative (i.e., indirectly measured) subjective norm component was broken into its subcomponents – influences of friends, family and partner.

Table 5.4 Description of study variables

| Variable | N | Minimum | Maximum | Mean | Standard Deviation |
|--|-----|---------|---------|---------|--------------------|
| Intention to acquire OCs OTC | 293 | -2.0 | 2.0 | -0.2765 | 1.603 |
| Attitude toward acquiring OCs OTC (indirect measurement $\Sigma e_i b_i$) | 294 | -20.0 | 28.0 | 3.1088 | 7.76 |
| Attitude toward acquiring OCs OTC (direct measurement) | 294 | -2.0 | 2.0 | 0.2007 | 1.249 |
| Subjective Norm (Indirect $\Sigma N b_i M c$) | 294 | -12.0 | 12.0 | -0.7347 | 3.90 |
| Subjective Norm (Direct) | 293 | -2.0 | 2.0 | -0.6724 | 1.280 |
| NbXMc (Family) | 294 | -4.0 | 4.0 | -0.2687 | 1.838 |
| NbXMc (Friend) | 294 | -4.0 | 4.0 | -0.1122 | 1.553 |
| NbXMc (Partner) | 294 | -4.0 | 4.0 | -0.3537 | 1.809 |
| Attitude toward risks ($\Sigma e_i b_i$) | 294 | -16.0 | 12.0 | -2.438 | 5.518 |
| Attitude toward benefits ($\Sigma e_i b_i$) | 294 | -10.0 | 12.0 | 4.074 | 4.640 |
| Evaluation Subscale | | | | | |
| Nausea* | 294 | -2.0 | 2.0 | -0.251 | 1.219 |
| Weight gain* | 294 | -2.0 | 2.0 | -0.915 | 1.115 |
| Pain in the legs* | 294 | -2.0 | 2.0 | -0.809 | 1.164 |
| Breast Cancer* | 294 | -2.0 | 2.0 | -1.778 | 0.740 |
| Personal expenditure | 294 | -2.0 | 2.0 | -0.823 | 1.087 |
| Avoiding pregnancy | 294 | -2.0 | 2.0 | 1.843 | 0.609 |
| Regulation of Menstrual cycle | 294 | -2.0 | 2.0 | 0.846 | 1.162 |
| Access to morning-after-pill | 294 | -2.0 | 2.0 | 0.476 | 1.435 |
| Convenience | 294 | -2.0 | 2.0 | 1.160 | 0.968 |
| Likelihood Subscale (Physician) | | | | | |
| Nausea | 293 | -2.0 | 2.0 | -0.05 | 1.253 |
| Weight gain | 293 | -2.0 | 2.0 | 0.614 | 1.139 |
| Pain in the legs | 293 | -2.0 | 2.0 | -0.372 | 1.255 |
| Breast Cancer | 293 | -2.0 | 2.0 | -0.143 | 1.316 |
| Personal expenditure | 291 | -2.0 | 2.0 | 0.845 | 1.159 |
| Avoiding pregnancy | 293 | -2.0 | 2.0 | 1.440 | 1.082 |
| Regulation of Menstrual cycle | 293 | -2.0 | 2.0 | 1.402 | 1.007 |
| Access to morning-after-pill | 293 | -2.0 | 2.0 | 0.300 | 1.420 |
| Convenience | 291 | -2.0 | 2.0 | 0.982 | 1.167 |
| Likelihood Subscale (OTC) | | | | | |
| Nausea | 292 | -2.0 | 2.0 | 0.503 | 1.253 |
| Weight gain | 292 | -2.0 | 2.0 | 1.006 | 1.038 |
| Pain in the legs | 292 | -2.0 | 2.0 | 0.232 | 1.254 |
| Breast Cancer | 292 | -2.0 | 2.0 | 0.219 | 1.287 |
| Personal expenditure | 292 | -2.0 | 2.0 | 0.161 | 1.386 |
| Avoiding pregnancy | 292 | -2.0 | 2.0 | 1.147 | 1.107 |
| Regulation of Menstrual cycle | 292 | -2.0 | 2.0 | 1.030 | 1.062 |
| Access to morning-after-pill | 292 | -2.0 | 2.0 | 0.715 | 1.420 |
| Convenience | 292 | -2.0 | 2.0 | 1.390 | 0.962 |

Table 5.4: Description of Study Variables (contd.)

| | | | | | |
|-----------------------------------|-----|------|-----|--------|-------|
| EvaluationXBelief (OTC) | | | | | |
| Nausea | 294 | -4.0 | 4.0 | -0.333 | 1.824 |
| Weight gain | 294 | -4.0 | 4.0 | -1.170 | 1.861 |
| Pain in the legs | 294 | -4.0 | 4.0 | -0.438 | 1.860 |
| Breast Cancer | 294 | -4.0 | 4.0 | -0.544 | 2.492 |
| Personal expenditure | 294 | -4.0 | 4.0 | -0.200 | 2.071 |
| Avoiding pregnancy | 294 | -4.0 | 4.0 | 2.16 | 2.237 |
| Regulation of Menstrual cycle | 294 | -4.0 | 4.0 | 1.08 | 1.946 |
| Access to morning-after-pill | 294 | -4.0 | 4.0 | 0.819 | 2.359 |
| Convenience | 294 | -4.0 | 4.0 | 1.72 | 2.186 |
| Normative Belief | | | | | |
| Friend | 292 | -2.0 | 2.0 | -0.202 | 1.413 |
| Family | 293 | -2.0 | 2.0 | -0.808 | 1.388 |
| Partner | 293 | -2.0 | 2.0 | -0.191 | 1.547 |
| Motivation to Comply | | | | | |
| Friend | 293 | -2.0 | 2.0 | -0.273 | 1.413 |
| Family | 293 | -2.0 | 2.0 | 0.201 | 1.112 |
| Partner | 293 | -2.0 | 2.0 | 0.399 | 1.547 |
| Decision to use OCs in the future | 292 | -2.0 | 2.0 | 1.054 | 1.356 |

* These items were reverse coded, representing negative evaluation of consequences.

Table 5.4 shows that the mean scores for the behavioral intention for the entire sample was -0.2765 (s.d.=1.603), representing somewhat a weak intention to acquire OCs over-the-counter. The mean for attitude scores, measured both indirectly and directly, were 3.108 (s.d.=7.76) and 0.200 (s.d.=1.249) respectively. Given the possible range of scores for the indirect measurement of attitude (-36.0 to $+36.0$), the mean score of 3.1 represented somewhat unfavorable attitude toward acquiring OCs over-the-counter. Similar to the indirect measurement of attitude, its direct counter part, too, represented neutrality (mean=0.20) toward acquisition of OCs over-the-counter. The results above also showed that subjective norm scores for both direct and indirect measures were in the negative direction, with the mean values of -0.6724 (s.d.=1.280) and -0.734 (s.d.= 3.908) respectively. These results indicated that subjects perceived low normative and motivational influences from their referents with regard to the acquisition

of OCs over-the-counter. A further examination of subcomponents that make up subjective norm, namely normative belief and motivation to comply, revealed that the mean values for normative belief items were all negative. In other words, subjects in the study felt it was unlikely that their family, friends, or partners (mean -0.808, -0.202, and -0.191) would think that they should buy OCs without a doctor's prescription. On the motivation scores, positive mean values indicated that subjects usually preferred to do what their family and partner thought they should do (mean 0.201 and 0.399 respectively). However, the mean score for the motivation to comply with a friend was -0.273, meaning that subjects did not perceive much motivational influence from this referent. The scores for indirectly derived attitude toward risks (-2.43) and attitude toward benefit (4.07) reported mean values in the opposite direction. Thus, subjects in the study reported more favorable attitude toward benefits accruing from OTC oral contraceptives than toward the risks of using them. Negative values for the mean attitude toward risks showed that subjects reported negative evaluations of physiological side effects of OCs and perceived higher likelihood of these resulting when OCs were to be acquired over-the-counter.

Table 5.4 shows that respondents evaluated all the items making up the risk subscale (i.e., nausea, breast cancer, weight gain, pain) negatively, with all the mean values in the negative direction. However, an item relating to breast cancer was evaluated more negatively than other items in the subscale, with the mean of -1.177 and standard deviation 0.7404. Similarly, all the benefit items in the subscale (i.e., regulation of menstrual cycle, avoiding pregnancy, emergency contraception, and convenience) were evaluated positively. However, the items relating to convenience and avoidance of

pregnancy received more positive evaluation than other items. These two items had a mean of 1.16 and 1.84, with standard deviations of 0.968 and 0.609 respectively. All the nine items making up the likelihood subscale (OTC) had positive mean scores. This indicated a belief among women that it was to some degree "likely" that the consequences listed would occur if OCs were acquired OTC. However, benefit items--convenience, avoidance of pregnancy, and regulation of menstrual cycle--exhibited larger mean values for likelihood (OTC) estimates compared to other items. In other words, subjects perceived there to be higher likelihood of convenience, pregnancy avoidance, and menstrual regulation if in fact OCs could be acquired without a physician's prescription. However, the examination of mean values for the risk items indicated that subjects also perceived there to be higher likelihood of physiological side effects--such as nausea, weight gain, breast cancer, and pain in the legs--occurring if OCs were used without professional supervision. This observation was further confirmed by comparing these means with the corresponding item means on the likelihood scale representing acquisition of OCs under a physician's supervision. Three risk items--nausea, breast cancer, and pain in the legs--displayed mean values in the negative direction, meaning that they perceived lesser likelihood in experiencing these consequences if OCs were acquired under a physician's supervision.

Comparison of Responses to Study Variables on Mail and Telephone Survey

Out of the total 294 women who participated in the study, 185 responded to the mail questionnaire. The remaining 109 were administered the questionnaire on the telephone by the Florida Survey Research Center. In order to rule out any possible bias in

the way women responded to the mail and telephone administration of the survey, analysis was conducted to determine if there existed any difference in women's response to the study variables on the instrument. Appendix F reports on a series of independent samples t-tests, conducted to compare subjects' responses to each of the study variables on the instrument. Independent samples t-tests were conducted on the means for two groups (mail and telephone sample) on all the 39 variables that were measured on the interval scale and also on variables that were derived from the original set of variables (i.e., indirect measures of model constructs). The mean values for only the following four variables were found to be significantly different for two groups at a 0.01 alpha level: a) Directly measured attitude toward acquiring OCs over-the-counter ($p=0.001$), b) attitude toward benefits ($p=0.001$), c) nausea (likelihood scale -OTC; $p=0.001$), and d) convenience (likelihood scale-MD; $p=0.003$). Thus, with the exception of these four variables, the comparison of mean values for all the study variables between the two samples indicated no further concern regarding the possible inequality of subject responses to the two methods of questionnaire administration.

Instrumentation

The internal consistency of different subscales of the OC attitude scale was redetermined using Cronbach's coefficient alpha. Table 5.4 shows the internal consistency coefficients for the evaluative and belief components of the instrument along with the coefficients for normative and motivation subscales of the instrument. Alpha levels of 0.5 or higher (Nunnally, 1967) were considered as acceptable levels to evaluate the individual items in each subscale. Thus, a coefficient alpha of approximately 0.6 was

set as an a priori goal for all subscales in the instrument. Inter-item correlations and corrected item-to-total correlations were examined for low correlations when the subscales failed to meet this level. The pilot test of the instrument indicated that there were two distinct components (beliefs about risk and beliefs about benefits) within both evaluative and behavioral belief subscales, with each component being comprised of 4 items. The item on OC expenditure was not considered to be a part of either of these components. The factor analysis results from the previous chapter showed that this item behaved as an independent factor and did not correlate with other items on the scale.

Table 5.5 Reliability Estimates of OC Attitude Subscales

| Subscale | Number of Items | Reliability |
|----------------------------------|-----------------|-------------|
| Evaluation component | | |
| Beliefs about benefits | 4 | 0.65 |
| Beliefs about risks | 4 | 0.62 |
| Likelihood Component | | |
| Beliefs about benefits | 4 | 0.71 |
| Beliefs about risks | 4 | 0.85 |
| Subjective Norm Component | | |
| Normative beliefs | 3 | 0.88 |
| Motivation to comply | 3 | 0.70 |

Table 5.6 Item-Total Statistics (Evaluation of Benefits Subscale)

| Benefit items | Corrected item-total correlation | Alpha if item deleted |
|----------------------------|----------------------------------|-----------------------|
| Convenience | .5503 | .5063 |
| Emergency Contraception | .3557 | .6563 |
| Regulation of menstr cycle | .4283 | .5844 |
| Avoidance of pregnancy | .4470 | .5854 |

Alpha = .6501

Table 5.7 Item-Total Statistics (Evaluation of Risks Subscale)

| Risk items | Corrected item-total correlation | Alpha if item deleted |
|------------------|----------------------------------|-----------------------|
| Breast Cancer | .3646 | .5156 |
| Nausea | .3959 | .6393 |
| Pain in the legs | .5407 | .4121 |
| Weight Gain | .4266 | .5002 |

Note: These items were reverse scored to reflect beliefs about risky consequences of using OCs
Alpha = .6160

Table 5.8 Item-total Statistics (Normative Belief Subscale)

| Sources of influence | Corrected item-total correlation | Alpha if item deleted |
|----------------------|----------------------------------|-----------------------|
| Family | .7324 | .8853 |
| Partner | .8138 | .8168 |
| Friends | .8102 | .8194 |

Alpha = .8891

Table 5.9 Item-total Statistics (Motivation to Comply Subscale)

| Sources of influence | Corrected item-total correlation | Alpha if item deleted |
|----------------------|----------------------------------|-----------------------|
| Family | .5534 | .5723 |
| Partner | .4549 | .6922 |
| Friends | .5605 | .5658 |

Alpha = .7043

The results of the internal consistency analysis indicated that none of the measures was problematic. Comparison of the reliability estimates of the subscales with those obtained from the pilot test of the instrument indicated that the results were consistent across the two samples. In fact, the risk and motivation subscales showed somewhat improved reliability estimates for the instrument. All the individual corrected item-total correlations (i.e., item-remainder correlation) were above 0.3 for each of the subscales (Table 5.6 –5.9). Since the coefficient alpha for each subscale was acceptable (0.6 and higher), and the corrected item-to-total correlations were sufficiently high,

further examination of inter-item correlation matrices for each subscale was not necessary.

Hypothesis Testing

Hypothesis 1

The first research hypothesis proposed that a woman's intention to acquire oral contraceptives over-the-counter would be explained by (a) her attitude toward acquiring them OTC and (b) her normative beliefs, weighted by her motivation to comply with those perceived norms. In testing this hypothesis, the intention to acquire oral contraceptives over-the-counter was modeled on a person's attitudes toward acquiring OCs over-the-counter and her subjective norms regarding the same, both derived as multiplicative products ($\sum b_{ie}i$ or OC-attitude, and $\sum N_b M_c$). Multiple regression analysis was performed to test this hypothesis (Table 5.10). In a prediction of intention, with multiplicatively derived attitudes and subjective norm as predictors, the total variance explained was 0.07. The overall regression model with attitude and subjective norm as predictors was significant ($p=0.001$), as indicated by the global F-test ($F= 12.38$). Also the regression coefficients for the two predictors were significant at 0.01 alpha level. However, the amount of variance explained was quite small. Standardized regression coefficients were .208 for attitude ($p=0.0001$) and 0.18 for subjective norm ($p=0.002$). The attitude was found to explain more of the variances, controlling for the other variable.

The model above was also evaluated by checking the plots of residuals against independent variables and also by conducting collinearity diagnostic tests for violation of assumptions of multiple regression. The assumptions are that (I) the true regression

function has the form used in the model – the linear function, (ii) conditional distribution of the dependent variable is normal, (iii) conditional distribution of the dependent variable has constant deviation throughout the range on an independent variable (i.e., homoscedasticity), and (iv) observations of the dependent variable are statistically independent (Agresti and Finlay, 1986). Of the four assumptions, violation of the homoscedasticity assumption is the most threatening and was the only one examined.

Examining the plots of residuals against the independent variables (see Appendix G, figures 5.1 and 5.2) checked the violation of the normality, homoscedasticity, and other assumptions. The homoscedasticity assumption is satisfied if the residuals fluctuate randomly about 0 as the values for independent variables increase. Residual plots against attitude toward the behavior (figure 5.1), and subjective norm (figure 5.2) do fluctuate randomly about 0 with no change in dispersion as the values for independent variables increase. This indicated that the assumption of homoscedasticity was also satisfied.

The model was evaluated for multicollinearity by using collinearity diagnostics. The concern regarding multicollinearity stems from the literature that has pointed to a possible shortcoming in the TRA model. For example, Miniard and Cohen (1981) question the claim made by the TRA that it can represent the relative importance of personal factor (i.e. attitude) and social factors (i.e., subjective norm). They contend that the model might be prone to “double-counting” of errors since the distinction above, in their opinion, is neither conceptually sound, nor operationally feasible. In other words, they point to a possibility of there being a statistical multicollinearity between the two predictor variables that might make the interpretation of beta coefficients difficult. The data analyzed here examined this possibility. There appears to be no evidence of

multicollinearity. According to Agresti and Finlay (1986), multicollinearity is evidenced by large standard error values for estimated regression coefficients. Further, they state that multicollinearity exists when there is a highly significant R-square between Y and the set of independent variables, but individually each partial regression coefficient is not significant. Neither of these situations seemed to exist in the current investigation.

In addition, to further rule out multicollinearity in this sample, collinearity diagnostics were conducted and variance inflation factors (VIFs) were computed. The collinearity diagnostics for attitude and subjective norm are shown in Table 5.10. By examining the condition index and VIF, collinearity problems can be detected. High numbers for condition index and VIF (the rule of thumb is 10) indicate an ill-conditioned problem. From Table 5.10, neither variable had a high number for either condition index or for VIF. Thus, the presence of a collinearity problem was not indicated.

A similar multiple regression equation was computed by regressing intention to acquire OCs OTC on directly measured attitude and subjective norm (Table 5.10). No formal hypotheses were proposed with regard to this relationship. In a prediction of intention, with directly measured attitudes and subjective norm as predictors, the total variance explained was 0.50. The overall regression model with attitude and subjective norm as predictors was significant ($p=0.0001$), as indicated by the global F-test ($F=147.97$). Also the regression coefficients for the two predictors were significant at a 0.01 alpha level. Standardized regression coefficients were 0.472 for attitude ($p=0.0001$) and 0.311 for subjective norm ($p=0.0001$). Here, too, the attitude was found to be the more important of the two predictors.

A similar set of residual plots was also prepared for the direct model. Collinearity diagnostics were computed as before. The model was found to satisfy all the necessary assumptions, and no multicollinearity was detected between the two predictor variables (Table 5.10) for the direct model.

Table 5.10 Multiple Regression and Collinearity Diagnostics

| Predictor Variables | R-Square | Beta | Std Error | Collinearity Diagnostics | |
|-------------------------------------|----------|-------------------|-----------|--------------------------|------|
| | | | | Condition Index | VIF |
| Attitude toward behavior (indirect) | 0.07 | 0.208 (p=.000) | 0.012 | 1.21 | 1.00 |
| Subjective norm (indirect) | | 0.180 (p=.002) | 0.023 | 1.55 | 1.00 |
| Attitude toward behavior (direct) | 0.502 | 0.472 (p=.000) | 0.068 | 2.54 | 1.67 |
| Subjective norm (direct) | | 0.311 (p=.000) | 0.067 | 1.17 | 1.67 |

Table 5.11 Pearson Correlation Coefficients (Indirect Model)

| Variables | Pearson Correlation | | |
|-----------------|------------------------------|--------------------------|-----------------|
| | Intention to acquire OCs OTC | Attitude toward behavior | Subjective Norm |
| Intention | 1.000 | 0.216 (p=0.000) | 0.188 (p=0.000) |
| Attitude | 0.216 (p=0.000) | 1.000 | 0.042 (p=0.236) |
| Subjective Norm | 0.188 (p=0.001) | 0.042 (p=0.236) | 1.000 |

Table 5.12 Pearson Correlation Coefficients (Direct Model)

| Variables | Pearson Correlation | | |
|-----------------|------------------------------|--------------------------|-----------------|
| | Intention to acquire OCs OTC | Attitude toward behavior | Subjective Norm |
| Intention | 1.000 | 0.669 (p=0.000) | 0.610 (p=0.000) |
| Attitude | 0.669 (p=0.000) | 1.000 | 0.634 (p=0.000) |
| Subjective Norm | 0.610 (p=0.000) | 0.634 (p=0.000) | 1.000 |

Tables 5.11 and 5.12 report on Pearson correlation coefficients computed between the predictor variables and predicted variable, and also between the two predictor variables, for both indirect and direct models. Almost all the individual correlations were found to be significant at 0.01 alpha level, with the exception of the correlation between the predictor variables for the indirect model ($p=0.236$).

Hypothesis 2

The second hypothesis examined the relationship between women's attitude toward acquiring OCs OTC and the strength of their intention to acquire them through that means. Further, it stated that there will be a positive association between favorable attitudes associated with the use of OCs acquired over-the-counter and intentions to acquire OCs through that means.

Computing Pearson Product Correlation Coefficients tested this hypothesis. This coefficient calculated the association between attitudes measured indirectly (i.e., OC-attitude; Σb_{ie1}) and intention to acquire OCs over-the-counter. Moreover, a similar correlation computed with the direct measure of attitude (general attitude; A-act) provided further confirmation of the hypothesis. In addition, the research question that proposed this hypothesis also sought to investigate the relationship between the two subcomponents (i.e., beliefs about risks and beliefs about benefits) on the OC-attitude scale and the intention score. For this purpose, two separately calculated, indirect attitude scores were computed for attitude toward risk and attitude toward benefit respectively. This was done by multiplying the evaluation scores for the each item on the risk subscale (of the evaluation scale) with the likelihood scores on the corresponding belief subscale,

and then by summing the score (i.e., Σb_{ie} computed separately for two subcomponents). Then the correlation between each of these attitude scores with the intention score was computed.

Tables 5.11 and 5.12 shown above report the correlational statistics related to the testing of Hypothesis 2. Indirectly measured attitude (Table 5.11) was found to correlate positively and significantly (0.216) with the intention to acquire OCs over-the-counter ($p=0.000$). A similar but higher correlation (0.669, $p=0.000$) was found between directly measured attitude and intention scores (Table 5.12). The results for the correlations between attitudes (toward risk and benefit) and intention scores are shown in Table 5.13.

Table 5.13 Correlations between Attitude (Toward Risk and Benefit) Scores and Intention

| Attitude Variables | Pearson Correlation with Intention to Acquire OCs OTC | Significance |
|--------------------------|---|--------------|
| Attitude toward risk | 0.075 | 0.199 |
| Attitude toward benefits | 0.188** | 0.001 |

** Correlation is significant at 0.01 level.

These correlations provide further insights into the relationships between any favorable or unfavorable attitude and women's subsequent intention to acquire OCs over-the-counter. A very low correlation was found (0.075, $p=0.199$) between the perception of risk and intention scores, whereas a positive and significant correlation (0.188, $p=0.001$) was found between perception of benefits and intention to acquire OCs OTC.

Hypothesis 3

The third hypothesis tested the relationship between indirectly measured subjective norm and intention to acquire OCs OTC. This hypothesis proposed that perceptions of the wishes of other people, weighted by the woman's motivation to comply with those wishes, was directly related to the woman's intention to acquire OCs over-the-counter. The testing of H3 involved the computation of Pearson correlation coefficient between the indirectly derived (multiplicative) measure of subjective norm ($\Sigma NbMc$) and behavioral intention score. From Table 5.11 it can be seen that the indirectly measured subjective norm was found to correlate positively and significantly (0.188) with the intention to acquire OCs over-the-counter ($p=0.001$). To gain further insights into the influence of different referents on women's intention to acquire OCs OTC, this research question also sought to investigate the relationship between individual components of subjective norm scale (i.e., family, friend, and partner) and behavioral intention. Pearson correlation coefficients were computed between the subjective norm scores for each individual referent (i.e., NbXMc) for the entire sample.

Table 5.14 Correlations between Referent Subjective Norm Scores and Intention

| Subjective Norm Scores | Pearson Correlation with Intention to acquire OCs OTC | Significance |
|------------------------|---|--------------|
| Family | 0.163 | 0.003** |
| Partner | 0.240 | 0.000** |
| Friend | 0.003 | 0.482 |

** Correlation is significant at 0.01 level.

The results are presented in Table 5.14. Subjective norm scores for family and partner as referents were found to correlate with intention scores positively and significantly. However, no significant association was found between friend and intention scores.

Hypothesis 4

This hypothesis tested the relationship between directly measured subjective norm and behavioral intention. The hypothesis proposed that the directly measured perceptions of subjective norms more supportive of OC acquisition over-the-counter were associated with stronger intentions to acquire OCs over-the-counter. Table 5.12 reports on the Pearson correlation coefficient for the two variables. A positive and strong correlation (0.61) was found between directly measured subjective norm and intention to acquire OCs over-the-counter ($p=0.0001$).

Research Question 2

This research question investigated the beliefs and attitudes that described the differences among women who intended to acquire oral contraceptives OTC and those who did not. In addition, this question was also expected to address the appropriateness of the TRA for women who had high behavioral intention (BI) scores versus those who had low intention scores. The assessment of the difference in beliefs between those who intended to acquire OCs over-the-counter and those who did not was made first by classifying women into one of the two groups, namely, "intenders" and "nonintenders". Then beliefs and attitudes held by these women regarding the acquisition of OCs over-

the-counter was compared across two groups. Women who indicated that it was to some degree likely that they would intend to acquire OCs over-the-counter (i.e., intention scores of 1 and 2) were classified as "intenders." Those who indicated that they were, to some degree, unlikely to acquire the pill OTC (i.e., intention scores of -1 and -2) were classified as "nonintenders." Subjects who responded in "neutral" (i.e., intention score of 0) were dropped from the analysis. First, the mean attitude scores -- both indirectly and directly measured -- for the two groups were computed and compared using t-test. Similar comparison between groups was made on their direct and indirect subjective norm scores. MANOVA, a statistical method that uses a simultaneous comparison of multiple means (Morrison, 1967; Stevens, 1992) was employed to examine the existence of any overall differences in beliefs between groups. This method computed simultaneous confidence intervals comparing the difference between means on the evaluation scores, likelihood scores, normative beliefs, and motivation to comply scores for those who intended to acquire OCs over-the-counter and those who did not. Then, individual mean scores on all the beliefs multiplied by evaluations (i.e., EiXBi), normative beliefs multiplied by motivation scores (i.e., NbXMc), for two groups were computed and individual means were compared to further explore the differences between groups. The analysis of beliefs thus provided additional insights into variations of intentions.

For the purpose of assessing individual as well as overall difference between the two groups, statistical analysis was carried out in two steps. In order to examine overall difference between the two groups on multiple dependent variables, multivariate analysis of variance (MANOVA) was conducted. Once overall differences were found between groups on any set of variables, individual differences that are significant were detected

using t-test procedure. This procedure used Hotelling's T^2 (Appendix I) to determine the significant pairwise multivariate differences, and then univariate t's were determined to see which of the variables were contributing to the significant pairwise multivariate differences. The results of the analyses are presented in the following section.

Of the 293 usable responses, the classification of respondents following the procedure described above resulted in two samples. The sample of "nonintenders" comprised 163 subjects, whereas the "intenders" group consisted of 109 subjects. First, examining the output for each analysis tested the assumptions for MANOVA. In testing multivariate null hypothesis, the assumptions are: (1) independence of observations, (2) multivariate normality on the dependent variable on each population, and (3) equality of the covariance matrices (Stevens, 1992). Drawing a random sample of subjects satisfied the first assumption. The second assumption was tested by two methods (Appendix H). First, the normal probability plots for each of the dependent measures was examined. Second, a non-graphical test called Kolmogorov-Smirnov test was employed to test normality (Stevens, 1992). Both methods indicated that there was no gross violation of normality assumptions for MANOVA (Appendix H).

Next, a two-sample homogeneity of variance test was conducted. In the two-sample test, there are two matrices (one for each group) and a test for the equality of variance-covariance matrices was necessary. The variance-covariance matrices were computed for each group using the means of the variables within the group (Appendix I). Thus each matrix indicated how much variability there was in a group. Combining these individual matrices into a common variance-covariance matrix resulted in the pooled matrix displayed in Appendix I. Two homogeneity-of-variance tests (Cochran's C and

the Barlett-Box F) were performed for each variable individually. The significance level indicated that there was no reason to reject the hypothesis that the variances in the two groups were equal.

The MANOVA design requires that the dependent measures be correlated – statistically as well as theoretically. In the current study, two components were identified within the evaluation and likelihood subscales of the instrument. They were labeled as ‘beliefs about risk’ and ‘beliefs about benefits,’ each one representing four items on the instrument. The previous instrument validation procedure indicated that these four items in each component were substantially correlated with each other. Therefore, the MANOVA was performed on these subcomponents separately. A similar analysis was also performed on the normative belief and motivation subscales of the instrument. Table 5.15 shows the results of MANOVA for each of the subscales with Hotelling’s T^2 statistic, as well as univariate tests with significance values. There was no significant overall differences in mean scores found between intenders and nonintenders on their evaluative subscale, for both risk and benefit items. However, there was significant difference between group means found for items on likelihood scales, for both risk and benefit item mean scores ($p=0.007$, $p=0.01$). Univariate F tests indicated that there were two items contributing most to the overall differences between the two groups on the risk subscale. These variables were nausea ($p=0.000$) and pain in the legs ($p=0.007$). From Table 5.16, the mean likelihood values on nausea and pain variables were higher for nonintenders (0.773 and 0.454) than for intenders, who had the mean item scores of 0.231 and 0.037 respectively for these two variables. In other words, compared to the intenders, nonintenders perceived a higher likelihood of these two adverse outcomes resulting when

Table 5.15 MANOVA: Differences in Mean Values on Dependent Measures for Intenders and Nonintenders

| Dependent Variables | Hotelling's T^2 | Multi-variate F | Significance | Uni-variate F | Significance |
|---|-------------------|-----------------|--------------|---------------|--------------|
| Evaluation subscale (Risk) | 0.00881 | 0.5879 | 0.672 | | |
| Nausea | | | | 0.1090 | 0.741 |
| Weight Gain | | | | 0.0408 | 0.840 |
| Pain in the legs | | | | 1.8152 | 0.179 |
| Breast Cancer | | | | 0.0901 | 0.764 |
| Evaluation subscale (Benefit) | 0.02057 | 1.3727 | 0.244 | | |
| Avoiding pregnancy | | | | 0.9022 | 0.343 |
| Reg of mens. Cycle | | | | 0.0065 | 0.935 |
| Emergency contraception | | | | 4.5066 | 0.035* |
| Convenience of use | | | | 0.6519 | 0.418 |
| Likelihood subscale (Risk) | 0.0542 | 3.6059 | 0.007** | | |
| Nausea | | | | 13.2131 | 0.000** |
| Weight Gain | | | | 0.8205 | 0.366 |
| Pain in the legs | | | | 7.4409 | 0.007** |
| Breast Cancer | | | | 1.2248 | 0.269 |
| Likelihood subscale (Benefit) | 0.0512 | 3.408 | 0.010* | | |
| Avoiding pregnancy | | | | 5.5257 | 0.019* |
| Reg of mens. Cycle | | | | 9.6502 | 0.002** |
| Emergency contraception | | | | 5.0789 | 0.025* |
| Convenience of use | | | | 1.7748 | 0.184 |
| Item cross products (Risk- EiBi) | 0.0146 | 0.9757 | 0.421 | | |
| Nausea | | | | 0.9827 | 0.322 |
| Weight Gain | | | | 0.9144 | 0.340 |
| Pain in the legs | | | | 1.5995 | 0.207 |
| Breast Cancer | | | | 0.7444 | 0.389 |
| Item cross products (Benefit EiBi) | 0.0329 | 2.1979 | 0.070 | | |
| Avoiding pregnancy | | | | 6.8045 | 0.010* |
| Reg of mens. Cycle | | | | 2.7466 | 0.099 |
| Emergency contraception | | | | 2.9298 | 0.088 |
| Convenience of use | | | | 2.2050 | 0.139 |
| Normative Belief subscale | 0.6290 | 55.98 | 0.000** | | |
| Family | | | | 144.1926 | 0.000** |
| Friend | | | | 98.4675 | 0.000** |
| Partner | | | | 118.0382 | 0.000** |

Table 5.15 MANOVA: Differences in Mean Values on Dependent Measures for Intenders and Nonintenders (contd.)

| | | | | | |
|--------------------------------|--------|--------|---------|--------|---------|
| Motivation subscale | 0.0195 | 1.7357 | 0.160 | | |
| Family | | | | 3.4090 | 0.066 |
| Friend | | | | 1.0564 | 0.081 |
| Partner | | | | 1.0836 | 0.067 |
| Subjective Norm (NbXMc) | 0.0758 | 6.7795 | 0.000** | | |
| Family | | | | 6.1746 | 0.014* |
| Friend | | | | 0.1123 | 0.738 |
| Partner | | | | 12.977 | 0.000** |

*Significant at 0.05 alpha level

N (Intenders) = 109, N(Nonintenders)=163

** Significant at 0.001alpha level

OCs were acquired OTC. Similar differences were found between the two groups on benefit items making up the likelihood scale of the instrument. For example, a set of three items contributed most to the overall differences between two groups on the benefit component of the likelihood scale. These variables were pregnancy avoidance, regulation of menstrual cycle, and emergency contraception, with $p=0.019$, $p=0.002$, and $p=0.025$ respectively. The examination of mean values (Table 5.16) for these items indicated that intenders perceived higher likelihood of pregnancy avoidance, menstrual regulation, and availability of emergency contraception (mean values of 1.333, 1.259, and 0.963) than did nonintenders (mean scores of 1.012, 0.852, 0.5706 respectively), when OCs were imagined to be acquired OTC.

No significant difference on group means was found for cross product scores derived multiplicatively from evaluative and likelihood components of the subscales. There was found to be an overall difference on mean scores for dependent measures for normative belief ($p=0.0001$) and subjective norm subscales. Significant differences were found between the two groups on the normative influences from all the three referents. However, compared to the intenders, nonintenders perceived lesser likelihood that all the

three referents would agree to their acquisition of OCs OTC. For example, from Table 5.16, for nonintenders, the mean scores for all the three referents were on the negative side of the scale for family, friend, and partner variables (-0.150, -0.784, and -0.8957), while the mean scores for intenders were on the positive side of the scale (0.2018, 0.7248, and 0.8716 respectively). However, no such difference was found for mean motivation scores between the two groups. There was found to be an overall difference between the two groups on their subjective norm component scores (NbXMc), specifically with regard to family and partner variables ($p=0.014$ and $p=0.000$). Consistent with the results above, nonintenders felt somewhat more constrained by their perceptions of their family's and partner's prescriptions with regard to the acquisition of OCs OTC. In other words, for nonintenders (Table 5.16), the mean scores for these two variables were more negative (-0.4908 and -0.6503) than for intenders (0.083 and 0.156). Thus, a negative subjective norm influence was felt more by nonintenders than by intenders, particularly with reference to their family and partners.

Following the assessment of overall difference in mean scores for the two groups and univariate tests, a series of t-tests was conducted to examine differences on individual items. Table 5.16 provides t-test results for group differences on some crucial study variables. Further, omnibus F tests above indicated that there existed overall differences between two groups on the following sets of variables: (a) variables making up behavioral belief (or likelihood) scale, (b) normative belief variables, and (c) subjective norm variables. Therefore, besides the crucial study variables, t-tests were conducted only for these variables to examine which of the variables contributed to the significant differences between intenders and nonintenders.

5.16 Independent Samples T Test for Variables in Intender and Nonintender Groups

| Variable | t | Mean (S.D.) | | Significance (2-tailed) |
|---|--------|---------------|----------------|----------------------------|
| | | Intenders | Nonintenders | |
| Intention to acquire OCs OTC | 53.605 | 1.64 (0.481) | -1.5 (0.492) | 0.000* |
| Attitude toward acquiring OCs OTC (indirectly measured) | 3.332 | 4.917 (7.376) | 1.779 (7.766) | 0.001* |
| Attitude toward acquiring OCs OTC (directly measured) | 13.636 | 1.192 (0.876) | -0.457 (1.039) | 0.000** |
| Attitude toward risks | 0.829 | -2.183 | -2.748 | 0.408 |
| Attitude toward benefits | 2.841 | 6.945 | 4.938 | 0.005** |
| Subjective norm (indirectly measured) | 2.698 | 0.046 (3.672) | -1.269 (4.124) | 0.008** |
| Subjective norm (directly measured) | 12.41 | 0.293 (1.204) | -1.306 (0.918) | 0.000** |
| Likelihood subscale | | | | |
| Nausea | -3.635 | 0.231 (1.27) | 0.773 (1.14) | 0.000** |
| Weight Gain | -0.906 | 0.944 (1.07) | 1.061 (1.01) | 0.366 |
| Pain in the legs | -2.728 | 0.037 (1.25) | 0.454 (1.21) | 0.007** |
| Breast Cancer | -1.107 | 0.111 (1.29) | 0.288 (1.28) | 0.269 |
| Avoiding pregnancy | 2.351 | 1.333 (1.02) | 1.012 (1.14) | 0.019* |
| Reg of mens. Cycle | 3.106 | 1.259 (0.90) | 0.852 (1.14) | 0.002** |
| Emergency contraception | 2.254 | 0.963 (1.19) | 0.570 (1.52) | 0.025* |
| Convenience of use | 1.332 | 1.472 (0.91) | 1.312 (1.00) | 0.184 |
| Personal expenditure | -2.416 | 1.312 (1.45) | 0.312 (1.33) | 0.016* |
| Normative Belief subscale | | | | |
| Family | 12.063 | 0.201 (1.40) | -1.503 (0.92) | 0.000** |
| Friend | 9.923 | 0.724 (1.20) | -0.784 (1.24) | 0.000** |
| Partner | 10.926 | 0.871 (1.27) | -0.895 (1.33) | 0.000** |
| Subjective Norm (NbXMc) | | | | |
| Family | 2.485 | 0.083 (1.59) | -0.490 (2.02) | 0.014* |
| Friend | -0.335 | -0.192 (1.48) | -0.128 (1.57) | 0.738 |
| Partner | 3.602 | 0.156 (1.71) | -0.650 (1.86) | 0.000** |

*Significant at 0.05 alpha level

N (Intenders) = 109, N (Nonintenders) = 163

** Significant at 0.001 alpha level

Significant differences were found for the mean attitude and subjective norm scores – both directly and indirectly measured – between intenders and nonintenders (Table 5.16). Intenders were found to have a more positive attitude (mean = 4.917) than nonintenders (mean = 1.77) toward acquiring OCs OTC, when attitude was measured indirectly. This difference was found to be significant at a 0.001 alpha level. The mean scores for the intenders and nonintenders on the direct measurement of attitude were 1.19 and -0.457, with the difference being statistically significant ($p=0.000$). Both intenders

and nonintenders were found to have their attitude toward risk scores on the negative side of the scale, with there being no significant difference between the two groups on this variable. However, significant difference was found between the two groups on their attitude toward benefits. Intenders were found to have a more positive attitude toward benefits (mean= 6.945) than nonintenders (mean= 4.938), with the difference being significant at 0.01 alpha level. Thus it appears that the perceptions regarding the risky consequences for the two groups are almost identical, with nonintenders holding somewhat more negative attitudes toward risk. However, the perceptions of benefits are significantly different for the two groups, with intenders having more favorable attitude toward benefits than nonintenders.

Similar, significant differences were found between the two groups on both direct and indirect measurements of subjective norm ($p=0.000$ and $p=0.008$). The mean values for both the groups on these model constructs are reported on Table 5.16. Consistent with the results from MANOVA above, the mean subjective norm scores (direct and indirect) for nonintenders were in the negative direction (-1.306 and -1.269), compared to the intenders who reported more positive (i.e., more likely) values on this variable (0.293 and 0.046). On the behavioral belief scale (i.e., likelihood scale), 6 of the 9 items showed significant group differences while the remaining three items (weight gain, breast cancer, and convenience of use) showed no group differences. Mean scores on all the items on the normative belief subscale, and two items (family and partner) on the subjective norm component were found to be significantly different for the two groups at the 0.05 alpha level.

Research Question 5

The fifth research question addressed the relative contribution of attitudes and subjective norms in predicting intentions to acquire OCs over-the-counter. No formal hypothesis was proposed in support of this research question, as there was no empirical evidence existing in the literature related to the study population.

Table 5.17 Relative Contribution of Attitude and Subjective Norm to Behavioral Intention

| Variables | Beta from Regression Equation | R Square | Correlation with Intention |
|--------------------------|-------------------------------|----------|----------------------------|
| Indirect Model | | | |
| Attitude toward behavior | 0.208 (p=0.002) | 0.07 | 0.216 (p=0.000) |
| Subjective norm | 0.180 (p=0.000) | | 0.188 (p=0.001) |
| Direct Model | | | |
| Attitude toward behavior | 0.478 (p=0.000) | 0.50 | 0.669 (p=0.000) |
| Subjective norm | 0.311 (p=0.000) | | 0.610 (p=0.000) |

This research question was primarily addressed by (1) examining the beta estimates in the regression equation that was computed in the testing of hypothesis 1, and (2) examining the Pearson correlation of the predictor variables with the intention to acquire OCs over-the-counter. Tables 5.17 report the values for beta estimates and correlation coefficients. For both directly and indirectly tested models, it appears that the attitude component contributes more to the variance in behavioral intention than subjective norm. Similarly, compared to the association between subjective norm and behavioral intention, there appears to be stronger association between attitude and intention scores for both the models tested.

Appropriateness of the TRA Model

In addition to the testing of the research hypotheses, the data was also analyzed further to obtain insights into the relationships among variables that were not hypothesized in the study. First, the appropriateness of the TRA was examined by computing a regression equation for the components of attitude toward the behavior measure and intention, namely, attitude toward risks and attitude toward benefits. This analysis was necessary given that the factor analysis of the data indicated that there were two independent factors within the attitude measure that was derived indirectly. Further, the internal consistency estimation for the EiXBi scale for the indirectly derived attitude measure indicated that this component had somewhat low Cronbach's alpha of 0.415. The low internal consistency for this subscale was probably due to the presence of the two independent factors within the subscale. Therefore, it was a matter of interest to the investigators to examine if the presence of two independent factors within the attitude measure resulted in any difference in the amount of variance explained by the independent variables on intention. To examine this possibility, the behavioral intention was regressed on the two independent factors -- attitude toward risk and attitude toward benefits -- along with subjective norm, which was also measured indirectly. Table 5.18 displays the results of the regression analysis for an indirect model, with the attitude measure broken into its subcomponents, for the whole research sample.

The results below indicated that there was no change in the amount of variance explained by the indirect model on intention when the components of attitudes were included in the model separately. The results above also showed that the beta coefficient for attitude toward risk was not significant in the prediction of intention. This

observation is consistent with the results obtained from the testing of H2, involving the bivariate relationship among these variables (Table 5.13).

Table 5.18 Regression of Behavioral Intention on Subcomponents of Attitude Toward Acquiring OCs OTC

| Variables | Beta from Regression Equation | R Square |
|--------------------------|-------------------------------|----------|
| Indirect Model | | |
| Attitude toward behavior | 0.208 (p=0.002) | 0.079 |
| Subjective norm | 0.180 (p=0.000) | |
| Indirect Model | | |
| Attitude toward risks | 0.105 (p=0.067) | 0.078 |
| Attitude toward benefits | 0.191 (p=0.001) | |
| Subjective norm | 0.178 (p=0.001) | |

A similar analysis was carried out to test the appropriateness of the theoretical framework for the mail and telephone samples in the study. Table 5.19 reports the results of two separate regression equations computed on mail and telephone data for the model variables. The results above show that the data obtained from both the samples fit the model well in its direct formulation. Both of the predictor variables were found to be significant in the prediction of intention for the direct model, for both telephone and mail sample. However, the indirect model fared poorly for the telephone sample, compared to the mail sample, in the prediction of intention. As can be seen from the table below, neither of the predictor variables was found to be significant in the prediction of intention for the phone sample.

Table 5.19 Appropriateness of TRA for Mail and Telephone Samples

| | Direct Model | | Indirect Model | |
|-------------------------------|-------------------|-------------------|-------------------|-----------------|
| | Mail | Phone | Mail | Phone |
| R-Square | 0.576 (p=0.0001)* | 0.509 (p=0.0001)* | 0.159 (p=0.000)* | 0.026 (p=0.253) |
| Beta (attitude) | 0.523 (p=0.0001)* | 0.569 (p=0.0001)* | 0.310 (p=0.0001)* | 0.091 (p=0.345) |
| Beta (Subjective Norm) | 0.288 (p=0.0001)* | 0.229 (P=0.005)* | 0.237 (p=0.001)* | 0.130 (p=0.177) |

* significant at 0.01 alpha level

In addition, because the factor analysis indicated that there were two independent factors present within the attitude measure, internal consistency reliability coefficients on EiXBi scale were computed for both mail and telephone samples separately. Cronbach's alpha for the mail and telephone samples were found to be 0.453 and 0.352 respectively. The reliability estimates were low for both scales, further confirming the presence of two independent factors. The low reliability coefficients for both telephone and mail samples also indicated that there were probably no major differences between the two samples on the way the data was collected. In other words, a low internal consistency of the scale was probably not due to the difference in the technique of survey administration; rather, the low subscale reliability was probably due to the presence of two independent factors within the attitude measure.

Thus, having ruled out a possibility of any significant influence of the survey technique on subjects' responses, both mail and telephone samples were tested further for the model appropriateness. Table 5.20 above shows the results of a comparison between the mail sample and telephone sample when the attitude measure was broken down into its components. The results above indicated that the data from the telephone sample did not fit the model well. In a prediction intention, only 2% of variation in intention was explained by the phone sample, whereas the mail sample explained 15% of the variation

in intention. None of the predictors were found to be significant in the prediction of intention, for the telephone sample, whereas significant beta coefficients were obtained for the mail sample at 0.001 alpha level.

Table 5.20 Mail vs. Phone Comparison on Attitude Components

| Regression | Mail | Phone |
|------------------------|----------------------|--------------------|
| R-Square | 0.157 (p=0.001)* | 0.026 (p=0.426) |
| Beta (attitude_risk) | 0.108 (p=0.108) | 0.064 (p=0.517) |
| Beta (attitude_ben) | 0.288 (p=0.0001)* | 0.082 (p=0.407) |
| Beta (Subjective Norm) | 0.234 (p=0.001)* | 0.133 (p=0.171) |

- significant at 0.001 alpha level

Next, a series of paired samples t-tests was conducted to examine the differences on the mean values for the likelihood scores (i.e., belief component of the instrument) for both physician and OTC sources. Table 5.21 displays t-test results for all the nine items comprising the perceived likelihood subscales, for both physician and OTC sources. The results below indicated that there were significant differences on subjects' responses to each of the likelihood items listed under physician and OTC sources. Further, the data indicated that subjects responded to all the risk items on the positive side of the scale for the OTC likelihood scale, meaning that they perceived a higher likelihood of risky consequences resulting from the use of OTC pills. The subjects also reported higher mean values for two of the benefit items (convenience and morning-after-pill) on the OTC likelihood scale, meaning that they perceived higher likelihood of beneficial outcomes occurring when OCs were acquired OTC.

Table 5.21 Mean differences Between Physician and OTC Likelihood Scales

| Variable | Mean (Physician) | Mean (OTC) | Mean difference | Std. Error | t | Sig (2 tailed) |
|----------------------------------|---------------------|---------------|--------------------|---------------|--------|-------------------|
| Likelihood Subscale (MD Vs. OTC) | | | | | | |
| Nausea | -0.05 | 0.503 | -0.558 | 0.063 | -8.825 | 0.0001 |
| Weight gain | 0.614 | 1.006 | -0.393 | 0.068 | -5.815 | 0.0001 |
| Pain in the legs | -0.372 | 0.232 | -0.606 | 0.068 | -8.974 | 0.0001 |
| Breast Cancer | -0.143 | 0.219 | -0.363 | 0.059 | -6.135 | 0.0001 |
| Personal expenditure | 0.845 | 0.161 | 0.690 | 0.101 | 6.818 | 0.0001 |
| Avoiding pregnancy | 1.440 | 1.147 | 0.291 | 0.070 | 4.159 | 0.0001 |
| Regulation of Menstrual cycle | 1.402 | 1.030 | 0.369 | 0.059 | 6.224 | 0.0001 |
| Access to morning-after-pill | 0.300 | 0.715 | -0.421 | 0.097 | -4.322 | 0.0001 |
| Convenience | 0.982 | 1.390 | -0.405 | 0.077 | -5.257 | 0.0001 |

The respondents also perceived that acquiring OCs with a prescription was more expensive than acquiring them OTC (mean 0.845 and 0.161 respectively). However, the mean values for pregnancy avoidance and regulation of menstrual cycle were higher for the physician likelihood scale than for the OTC scale.

Table 5.22 Bivariate Correlations Between Intention and Other Variables

| Variables | Correlation with Intention | Significance |
|--------------------|-------------------------------|--------------|
| Age | 0.132 | p=0.024 |
| Past Use of OCs | -0.195 | p=0.001 |
| Current Use of OCs | -0.010 | p=0.859 |

Finally, some exploratory analyses were also conducted to investigate the influence of demographic and other variables on intention to acquire OCs over-the-counter. First, the bivariate correlations between intention to acquire OCs OTC and other variables, such as age, past and current use of OCs, were computed. Table 5.22 reports the correlation coefficients for these relationships. The results above showed that there was no significant association between the current use of OCs and women's intention to acquire them OTC (-0.010 ; $p=0.859$). However, a significant negative correlation (-0.195 ; $p=0.001$) was found between the past use of OCs and intention. A positive and

significant correlation between age and intention (0.132; $p=0.024$) was also found for the entire study sample.

Tests were performed to examine any differences on behavioral intention among women belonging to different religions. A one-way ANOVA for the group differences on intention produced a global F of 1.625 that was not significant ($p=0.184$), indicating that there was no difference among women on their intention to acquire OCs over-the-counter when they were classified into different religious categories. A t-test was also performed to further examine any difference on intention scores for Catholics and non-Catholics. This was accomplished by first classifying women into two religious categories -- Catholics and non-Catholics. Non-Catholics were grouped together by collapsing the item responses of those women who indicated that they belonged to one of the three other religious categories. Thus, there were totally 269 usable responses. Table 5.23 above reports t-tests between the two groups on the directly measured attitudes, subjective norm, and on intention scores.

Table 5.23 Differences on Intention and Attitudes Between Catholics and Non-Catholics

| Variables | N | Mean | Mean Difference | t | Std. Error | Significance |
|---------------------------------|-----|--------|-----------------|--------|------------|--------------|
| Attitude (Direct) | | | | | | |
| Catholics | 74 | 0.1351 | -0.104 | -0.611 | 0.171 | 0.542 |
| Noncatholics | 196 | 0.2398 | | | | |
| Subjective Norm (Direct) | | | | | | |
| Catholics | 74 | -0.837 | -0.232 | -1.315 | 0.177 | 0.190 |
| Noncatholics | 195 | -0.605 | | | | |
| Intention | | | | | | |
| Catholics | 74 | -0.459 | -0.285 | -1.322 | 0.219 | 0.195 |
| Noncatholics | 195 | -0.174 | | | | |

Table 5.24 Differences on Intention and Attitudes (Nurse Practitioner vs. Physician)

| Variables | N* | Mean | t | Mean Difference | Std. Error | Significance |
|--------------------------|----|--------|-------|-----------------|------------|--------------|
| Attitude (Direct) | | | | | | |
| Physician | 85 | -0.258 | 1.028 | 0.246 | 0.240 | 0.306 |
| Nurse Practitioner | 46 | -0.369 | | | | |
| Intention | | | | | | |
| Physician | 85 | 0.170 | 0.369 | 0.110 | 0.300 | 0.713 |
| Nurse Practitioner | 46 | -0.080 | | | | |

N=133 current users of OCs.

The results above show that there was no difference between Catholics and non-Catholics on important study variables. A similar analysis was performed to test differences on intention scores between those women who obtained their OCs from nurse practitioners and those who obtained them with a physician's prescription. Table 5.24 above presents the t-test results on intention and attitude (direct) measures for the two groups. The results indicated that there was no significant difference between the two groups on both intention and attitude measures. These results indicated that women's intentions to acquire OCs OTC did not differ even when their sources of acquisition in the past were different.

Summary

This chapter presented results of the tests of hypotheses and the research questions along with the evidence of the reliability and validity of measures. Of the four hypotheses proposed, three were supported. The first hypothesis, which examined the utility of the theory of reasoned action in the prediction of behavioral intention, was disconfirmed on practical grounds by the results of the regression analysis, since only about 7% of variance in intention was explained by the model predictors. However, statistically, the model variables were found to be significant in the prediction of

behavioral intention. In the prediction of intention to acquire OCs over-the-counter, predictor variables, namely, indirectly measured attitudes and subjective norm, failed to explain much variance in the predicted variable. However, three other hypotheses that proposed associations among independent variables and behavioral intention were supported by the study data. In addition, an exploratory investigation examining the differences on study variables for those who intended to acquire OCs over-the-counter and those who did not was conducted. This investigation provided evidence that there indeed were some differences between these two groups on their perceptions of risks and benefits associated with the use of oral contraceptives. This chapter also explored the possibility of there being a variation in intention due to different techniques that were used in the data collection, and tested the appropriateness of the TRA model when the study sample was divided into mail and telephone samples. The data obtained showed a better fit for the model for the mail sample than for the telephone sample. The comparison of the model was also made by computing regression equations separately for the two samples, and by incorporating the components of attitude in the regression model as predictor variables. The results indicated that a better prediction of intention to acquire OCs over-the-counter was obtained by women's attitude toward the benefits than by their perceptions of risks. In addition, this chapter also reported data analyses performed to investigate the differences on responses to study variables when demographic and other information were also included in the analysis. The results showed no significant differences on behavioral intention for people belonging to different religions. The next chapter discusses these results in more detail. It also presents recommendations for future research.

CHAPTER 6

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The goal of this study was to test the theory of reasoned action in the prediction of intention to acquire OCs over-the-counter among female students attending the University of Florida. The conceptual framework for this research consisted of concepts such as attitude toward the behavior, subjective norm and behavioral intention. This chapter provides a summary of the study findings and presents conclusions and implications of the current research. The first section presents a discussion of the study's findings. Next, the conclusions reached from these findings about women's intention to acquire OCs over-the-counter will be discussed. The last section presents recommendations for future research, with implications for reproductive health care in the United States.

Discussion

The sociodemographic profile of the sample was found to be typical for a campus student population. The mean age of the study population was 24 years. Subjects' responses for questions pertaining to the knowledge of oral contraception and any past or current use indicated that the women were familiar with this method of contraception.

The first hypothesis (H1) explored in the study examined the linear relationship among the model's crucial variables. Attitude toward acquiring OCs over-the-counter and subjective norm regarding their acquisition OTC were hypothesized to predict intention

to acquire OCs over-the-counter. The usefulness of the conceptual model was tested by regressing intention to acquire OCs over-the-counter on both directly and indirectly measured determinants of intention. In both cases, attitude toward the behavior and subjective norm were found to be statistically significant in the prediction of intention. However, even though both variables were individually significant in their prediction of intention, their value as combined predictors of intention appeared to be questionable. This is because only about 7 percent of variance in the behavioral intention was accounted for by the combination of these two variables in an indirect model.

The model that tested the relationship between behavioral intention and its multiplicatively (i.e., indirectly) derived determinants was a model of primary interest because this model allowed us to break down the determinants of intention into its components – beliefs and evaluation. Such a treatment of the model would not have been possible with a direct conceptualization of model constructs. Evaluation of the consequences of using oral contraceptives, multiplied by the perceived likelihood of these consequences occurring if OCs were acquired OTC provided further insights into the components of attitude toward acquiring OCs over-the-counter. A similar approach in breaking down the subjective norm component in terms of normative belief and motivation to comply was adopted to investigate the role of social factors in shaping attitude and subsequent intention. An aspect of particular interest to this study, which was facilitated by the use of the so-called indirect model, was the defining of attitude toward the behavior in terms of attitude toward risks and attitude toward benefits of using OCs. This formulation allowed the investigators to examine the effect of perceptions of risk and benefit on attitudes independent of each other. Both attitude and subjective norm

were found to be statistically significant in the prediction of intention. However, both models did indicate that attitude was the most important of the two predictors of intention.

While these results are comparable to the general findings on the theory of reasoned action, the role of attitudes and subjective norm, especially when they are measured indirectly, as the determinants of OC intention is somewhat circumspect. This is particularly evident when a comparable, but conceptually different, relationship between directly measured determinants of intention and the intention itself displayed a stronger relationship. For example, comparison of R-square values obtained from both the direct and indirect models indicated that the TRA seemed to fit a direct model ($R\text{-square}=0.5$) better than its indirect counterpart ($R\text{-square}=0.07$). In other words, the variation on women's intention to acquire OCs over-the-counter was explained by its determinants to an extent of 50% by the direct model, compared to only 7% variance explained by the indirect model. These findings are interesting since they discern the utility of the same model when formulated differently from the conceptual and methodological standpoint. Thus the predictive validity of the theory of reasoned action in the prediction of intention to acquire OCs is not only a matter of methodological significance but also a matter of practical importance.

It must be noted here that, while observations made above seem to question the validity of the model to the present investigation, it's by no means an implication here that the model is an inappropriate one. On the contrary, the model seems to be very useful in advancing our understanding of the reproductive behavior, both from the theoretical and practical standpoint. Yet, the model used here is not without its shortcomings. For

example, the examination of hypotheses 2, 3 and 4 provide information about the model when conceptualized in two different ways. Hypothesis 2, which examined the relationship between attitudes and intention, reported that the attitude measured indirectly correlated positively and significantly (0.216) with the intention to acquire OCs over-the-counter ($p=0.000$). But a similar but stronger correlation (0.669, $p=0.000$) was found between directly measured attitude and intention scores. Thus it appears that attitudes when measured directly, ignoring the evaluations and beliefs, are a better determinant of intention. However, when broken into its component parts, a similar relationship does not seem to hold. A clearer picture seems to emerge when the results for the correlations between attitudes derived from its components (toward risk and benefit) and intention scores are examined. This ambiguity in the model was confirmed again with the testing of hypothesis 3 and 4, which examined the relationship between subjective norm and behavioral intention, when subjective norm was measured both directly and indirectly. Thus, the items in the indirect measures did not appear to tap relevant components of attitude.

Our understanding of the reproductive behavior was advanced with the testing of all the hypotheses above. The analytical findings pointed out that women who held favorable attitude toward the consequences of using OCs preferred to obtain them without a physician's prescription. The second hypothesis also confirmed this fact (Table 5.13). In addition, this hypothesis testing indicated a low correlation (0.075; $p=0.199$) between the perception of risk and intention scores, whereas a positive and significant correlation (0.188, $p=0.001$) was found between perceptions of benefits and intention to acquire OCs OTC. This relationship was in the expected direction. Further, examination

of beliefs helped explain why some women intended to acquire the pill over-the-counter while some did not. To illustrate, the Table 5.16 shows the difference in the perceptions of risk and benefits between two groups. It appears that physiological side effects and their perceived effectiveness were the major considerations that entered into women's decision to acquire or not to acquire OCs OTC. For example, the study results indicated that almost all the women in our sample believed using the pills would lead to minor side effects (such as nausea, pain in the legs etc.). They also agreed with each other on the beneficial aspects of using the pill. In support of this argument, the MANOVA (Table 5.15) found no overall difference between the two groups of women (intenders Vs nonintenders) in the way they evaluated the risks and benefits of using OCs ($p=0.672$ and $p=0.244$). Instead, the difference between the two groups was found on their perceived likelihood of the events occurring if OCs were in fact used without a physician's prescription ($p=0.007$ and 0.010). This is an interesting observation from the standpoint of individual perceptions of risks and benefits.

The women who perceived that OCs were likely to produce negative outcomes when bought OTC were the ones who did not intend to buy them through that means, even though their evaluation of the outcomes (degree of importance) was very similar to those who intended to buy them OTC. The results of MANOVA (Table 5.15) and T-tests of study variables (5.16) further emphasize this observation. For example, from Table 5.16, on the behavioral belief scale (i.e., likelihood scale), 6 of the 9 items showed significant group differences while the remaining three items (weight gain, breast cancer, and convenience of use) showed no group differences. Thus, it appears that a likelihood component of the scale worked as a major contributor to the variation in intention.

Significant differences were also found for the mean attitude scores – both directly and indirectly measured – between intenders and nonintenders (Table 5.16). Intenders were found to have a more positive attitude (mean = 4.917) than nonintenders (mean = 1.77) toward acquiring OCs OTC, when attitude was measured indirectly. This difference was found to be significant at a 0.001 alpha level. The mean scores for the intenders and nonintenders on the direct measurement of attitude were 1.19 and -0.457, with the difference being statistically significant at 0.001 alpha level.

In addition, from Table 5.4 it is evident that a majority of the women in the study reported more favorable attitude toward benefits (mean = 4.07) accruing from OTC oral contraceptives than toward the risks of using them (mean = -2.43). Negative values for the mean attitude toward risks showed that subjects reported negative evaluations of physiological side effects of OCs and perceived higher likelihood of these consequences resulting when OCs were acquired over-the-counter. This observation was further confirmed by the results of the testing of the second hypothesis in the previous chapter. This hypothesis testing examined the correlations between attitudes (toward risk and benefit) and intention scores, as shown in Table 5.13. These correlations provided further insights into the relationships between any favorable or unfavorable attitude and women's subsequent intention to acquire OCs over-the-counter. A very low correlation was found (0.075, $p=0.199$) between the perception of risk and intention scores, whereas a positive and significant correlation (0.188, $p=0.001$) was found between perception of benefits and intention to acquire OCs OTC.

However, a low predictive validity of the indirect model (compared to the direct model) raises important issues from the theoretical standpoint. For example, although

seemingly a reasonable basis for making a decision, questions of safety, effectiveness, cost etc. seem to constitute only part of the picture, especially given low R-square and r values among variables. The questions regarding autonomy, morality, guilt etc. are also likely to play a major role in OC acquisition. These issues, however, were not raised in the questionnaire that was given to the women. Fishbein (1975) is of the view that all the variables that are not directly related to the intention are external to the model, thereby compelling one to treat these variables as external variables. Therefore, the multiplicative (indirect) model that was used in the study failed to elicit information on these aspects of OC acquisition. It is likely that the measurement of other concerns would have added to the predictive power of the model. While it was clear that the indirectly measured attitude as a function of beliefs did not explicitly incorporate the beliefs about morality, guilt etc., such beliefs perhaps did contribute implicitly to the attitude that was measured directly. And there was no way of ascertaining this possibility given the methodology used in our study. For the majority of the unmarried women in the sample, use of birth control pills is usually associated with the issue of premarital sexual intercourse. Therefore, it is possible that their attitude toward the pill made persons more negative toward their easier acquisition. Consistent with this notion, questions on beliefs about morality, guilt etc. would have been more appropriate to ask of this population. This would have probably added to the predictive ability of the model. The chapter on literature review also provides considerable support to this viewpoint. Since these questions were not asked of the study subjects, the prediction of intention in this study was found to be moderate.

On the normative side, the women's major concerns centered on the prescriptions of their family and partner. They were highly motivated to comply particularly with the

wishes of their family and partner, but they reported moderate motivation to comply with the wishes of their friends. Further, while the MANOVA showed no difference in the motivation score for the two groups, the difference in the normative influence for two groups was significant. A lack of difference in the motivation score was probably expected since the items comprising motivation did not make any reference to the acquisition of OCs over-the-counter. In other words, while the statements concerning normative influence were context-specific (OC acquisition OTC), statements related to motivation were general. For example, as prescribed by Ajzen and Fishbein (1980), and as was done in the current study, the statement concerning motivation was presented as "Generally speaking, I prefer to do what my family members think I should do." As can be seen from this statement, lack of context (i.e., acquisition of OCs OTC) rendered the statement less discriminating of the two groups as far as the response to it was concerned. Thus, the major contribution to subjective norm variance was made by the normative belief component. Here, too, as can be seen from Table 5.14, normative influences from family and partner ($p=0.003$ and $p=0.000$) seemed to receive more weight on intention than from a friend ($p=0.482$).

The comparison of the likelihood responses on the two subscales indicated that women perceived there to be a higher likelihood of risky consequences resulting when OCs were acquired OTC than when they were acquired with a physician's prescription. The results indicated that women's perceptions of risks were more negative with regard to the acquisition of OCs over-the-counter. For example, the mean perceived likelihood values were higher for all the risk items on the OTC subscale compared to the physician subscale (Table 5.4). It appears that their perceptions of risks, particularly with regard to

weight gain, nausea, and pain in the legs, were perhaps misplaced or not based on personal experiences since such effects are known to result irrespective of the mode of OC acquisition. The implications of this observation are important in the sense that these findings point to a possible misconception among respondents about the side effects of OCs. Further, their beliefs that OTC pills were more likely to lead to negative consequences have relevance for policies concerning the switching of birth control pills. For example, women's expressed concerns regarding the side effects of the drug as evidenced by this study demand further tests of scientific validity, especially since it's been argued by experts that OTC pills are safer than most other drugs on the market. It's not known if the negative perceptions are a result of possible misconceptions, prior experience with OCs, or based on women's knowledge of scientific facts.

Contrary to the responses above, the results also indicated that women's perceptions of benefits regarding the acquisition of OCs OTC were in the expected direction. For example, all the women in the study sample perceived there to be a higher likelihood of convenience, access to emergency contraception, and cost savings. However, the mean values for the pregnancy avoidance indicated that women thought prescription OCs were more likely to lead to pregnancy avoidance than OTC pills (Table 5.21). The results from this analysis indicated that there were substantial differences on perceptions of likelihood on all the nine items on the belief subscales, for both physician and OTC sources. Thus, it appears that women's perceptions of risky consequences are more negative with regard to the acquisition of OCs OTC, while their perceptions of benefits of OTC pills are more positive compared to the prescription OCs. Therefore, it follows that women exhibited more favorable attitudes toward the beneficial aspects of

using OCs, whereas their attitudes regarding the risky effects of OCs were comparatively more unfavorable.

Additional data analyses conducted for the purpose of examining the relationships among the study variables revealed the following. First, even though there appeared to be no major differences on subjects' responses to a majority of the measures employed in both telephone and mail samples, some minor differences remained unexplained. For example, the testing of the appropriateness of the TRA for both telephone and mail samples indicated that there were no differences between the two samples in terms of the amount of variation explained on intention when the model was formulated directly. In other words, for a direct model, the regression equations computed were almost identical (Table 5.19), with about 50% variance in intention explained by the predictor variables, for both telephone and mail samples. However, the data did not seem to fit the model well when a similar regression equation was computed for an indirect model (Table 5.19). The results showed substantial difference in the amount of variation explained on intention by its predictors, for both telephone and mail samples. In fact, a significant prediction of intention was achieved with a mail sample for an indirect model, with beta coefficients being significant for both the predictors. However, none of the predictor variables was significant, either individually or in combination, in a similar regression equation computed for the phone sample (Table 5.19). These results indicated that compared to the phone sample the mail sample was somewhat better in the prediction of intention since the mail data seemed to fit the model better in its indirect conceptualization. It is difficult to explain why these differences between the two samples arose in terms of the model appropriateness since sufficient care was taken by

the investigators to ensure that both mail and phone administrations were similar in format as much as possible. However, one speculation could be that perhaps the instrument used in the study was not appropriate in its original form for the telephone administration.

Second, consistent with the factor structure, breaking down of the indirect attitude measure into its factors (attitude toward risks and benefits) resulted in no significant changes in the prediction of intention. The results from Table 5.18 indicated that, for the entire study sample, the amount of variance in intention explained by the predictors remained the same when the behavioral intention was regressed on the factors derived from the indirect measure of attitude. An R-square value of 0.079 was obtained when intention was regressed on the attitude toward the behavior (indirect) and subjective norm (indirect), while an R-square value of 0.078 was obtained when intention was regressed on attitude toward risk, attitude toward benefits, and subjective norm (Table 5.18), each one derived indirectly. However, attitude toward risk was not found to be significant in the prediction of intention ($p=0.067$), while the other two components were found to be significant at 0.01 alpha level. Thus, the indirect formulation of TRA model seems to work even when the components of the attitude measure are separately introduced in the regression equation. The results of this analysis also indicated that attitude toward benefits was a better predictor of intention than attitude toward risks and subjective norm (beta coefficients of 0.191, 0.105, and 0.178 respectively). These findings are interesting since they point to a possibility that women's intentions might be more a function of beliefs about benefits of acquiring OCs over-the-counter than of beliefs about risks. Thus, while physiological side effects seemed to differentiate women on their intentions (i.e.,

intenders and nonintenders), perceptions of benefits were instrumental in the determination of the actual intention.

Third, the additional statistical analyses also indicated that there was no association between women's current use of OCs and their intention. However, a significant, negative correlation was found (-0.195 ; $p=0.001$) between women's reported past use of OCs and intention. Thus, prior experience with the use of OCs seemed to make women less likely to intend to acquire OCs over-the-counter. This relationship needs to be explored further to understand reasons why women may have felt less inclined to acquire OTC pills given their past experience with them. Furthermore, there was no difference in women's intention to acquire OCs over-the-counter when they were classified based on their religious preferences. Thus, the influence of religion on their intention to acquire OCs over-the-counter was not evident. In addition, no differences in intentions were found when women's religious preference was dichotomized into Catholics or non-Catholics and the mean values were compared for the two groups.

Finally, the study also examined the differences in behavioral intention and attitudes between those women who acquired OCs from a physician's office and those who obtained them under a nurse practitioner's supervision. No significant differences were found on these measures for the two groups. Thus, it appears that the acquisition of OCs from a source other than a physician's office did not favorably predispose women towards intending to acquire them OTC.

The generalizability of these data is perhaps questionable to other populations. The study population was primarily white, young, well educated, with insurance coverage. A majority (64%) of the students identified physician's office as the main

source for OCs, while about 34% of those who had used OCs in the past obtained them after consultation with a nurse practitioner. This has implications for making OCs available from sources other than those considered traditional. About 77% of the sample had used oral contraceptives in the past. Thus the knowledge of oral contraception and familiarity with this method of contraception was fairly obvious in the student sample. About 45% of respondents on campus identified themselves as the current users of OCs. While only about 37% of the sample reported intentions to acquire OCs without a physician's prescription, about 58% reported that they were likely to choose OCs from among other forms of contraception. These statistics further confirmed the popularity of this method of contraception, particularly among a college population.

Conclusion

In sum, it is clear from the results of the study that a woman's intention to acquire oral contraceptives with or without a prescription is ultimately determined by her beliefs concerning the advantages and disadvantages of using the method and her beliefs that relevant referents think she should or should not use that method. The current study provided only a moderate support for the theory of reasoned action. This was evidenced by a low amount of variance in intention score explained by the model predictors. However, the findings of the present study support the following general conclusions: (1) women who expressed more favorable attitudes toward acquiring OCs OTC reported stronger intentions to acquire OC's over-the-counter, (2) women's attitudes are stronger determinants of intention to acquire OCs over-the-counter than are their perceptions of normative support among key referents, (3) women's attitude toward the beneficial

consequences of using OCs OTC are a better predictor of behavioral intention than are their attitudes toward risky consequences, (4) the theory of reasoned action seems to work best when attitudes and subjective norms are measured directly than when they are derived multiplicatively, (5) even though the appropriateness of an indirect model of TRA might seem questionable for a study of this kind, it seems to provide better insights into women's contraceptive decision making in terms of different beliefs that make up components of attitude. Ajzen and Fishbein (1980) state that the importance of attitudes and subjective norms in the determination of behavioral intention depends on the particular behavior and the particular population that is studied. In view of this assertion made by the model proponents, it might be worth examining the above relationship in another population.

Is there any preference for acquiring OCs OTC among the population that was studied? Although this question could not be addressed directly, given the low R-square value, it is reasonable to infer that favorable attitude and greater perceived social norms did not necessarily translate into stronger intentions. If intention alone is a criterion for switching OCs to over-the-counter, the present study seems to offer little support for such a step. This is because only 109 women out of 294 that were surveyed (37%) indicated that they were, to some degree, likely to acquire OCs over-the-counter. However, further investigation may be necessary to study how intentions translate into preferences before any conclusive remarks can be drawn in this regard. Given that the association between directly measured attitude and intention was strong, the women in the study may have felt constrained by a relatively lesser support they perceived from their referents. Additional

research is needed to clarify whether women who have stronger intentions subsequently acquire OCs OTC than do women who have weaker intentions.

In sum, the current findings suggest that a theory that has been successfully applied to a wide range of family planning behaviors in diverse populations is less supportive of predicting a related reproductive behavior – OC acquisition OTC. Taken as a whole, the results of the study reveal less support for the prediction of intention to acquire OCs OTC using TRA. Yet, the theory seems to work well in its direct form. However, keeping in mind some of the limitations of the study (such as a homogeneous student sample, lack of measures of ultimate behavior itself), it might be worthwhile applying this model to a more diverse population. Also, the theory is useful in the sense that its multiplicatively derived conceptualization seems to provide additional insights into salient beliefs that shape women's attitude and any importance such beliefs may have in shaping the ultimate behavior.

Study Implications and Recommendations for Future Research

The findings from the study indicated that intention to acquire OCs over-the-counter is based on both attitudinal and normative considerations. It must be recognized that the proposal to make birth control pills available is an innovative one. The goal of this program is to make oral contraceptives more accessible to the population that intends to use them, for the purpose of family planning, avoiding pregnancy, or reducing unwanted birth rates in teenage populations. An innovative program like the one proposed here may be in part motivated by the desire to enhance the individual's reproductive autonomy. It can be argued that people so motivated attempt to seek

information about newer approaches to birth control and be receptive to newer techniques. However, it is not known if such motivations are hindered by misconceptions people may hold regarding new techniques. For example, it is possible that the perceptions of subjects in this sample regarding the consequences of using OCs (such as incidence of breast cancer, blood clots etc.) are more negative than is supportable by scientific evidence. In other words, there probably were misconceptions about the use of OCs that was not valid scientifically. This observation is further confirmed by the comparison of the mean likelihood values for the OTC and physician sources, where women reported higher perceived likelihood of risky consequences resulting from the use of OCs acquired OTC.

Proponents of OTC status for OCs point to years of studies showing the pill to be safe, probably safer than many OTC drugs (Trussell et al., 1993; Grimes, 1993; Potts, 1995). They contend that concerns about health risks do not stem from findings that OCs are inherently unsafe when used as directed. Rather, the potential risks involve a series of secondary concerns: failure of OCs to protect against sexually transmitted diseases (STDs), use in combination with other drugs that reduce effectiveness, reduction in health screening associated with securing a prescription, or possible use by women with contraindications. The risks of OC use must be weighed against the protective health benefits, such as the prevention of unwanted pregnancies and lower incidence of ovarian and endometrial cancers. The task of weighing the risks and benefits of OCs is somewhat different for the pill than it is for other drugs. A properly designed patient education program can perhaps help people understand the risks and benefits, thereby overcoming any initial resistance to innovation.

As an example of a patient education program, women may be recommended to have initial blood pressure test and breast examinations before OCs are acquired OTC. This is to rule out cancers of breast and reproductive organs. Many clinicians routinely perform PAP smears, although they often prescribe pills on the same visit, before they receive test results (Samuels et al., 1994). This screening pursuant to prescribing OCs provides opportunities for general health examinations and screening for STDs. For poor women this is considered to be the only point of entry into the health care system. Therefore, according to some opponents of the switch, if OCs are sold over-the-counter, a counseling opportunity for physicians is lost. As a consequence, according to one expert (Samuels et al., 1994), the necessary care may shift from precontraceptive counseling to emergency or crisis care for women who misapprehend OC side effects, such as bleeding irregularities. However, it must be emphasized to these women that such screening as part of the process is largely unrelated to any particular risks involved in taking OCs. Thus, an educational program that evaluates the possible loss of patient compliance and pill inefficacy resulting from improper use of OCs is critical to decisions about switching birth control pills to over-the-counter status.

The study findings suggest that attitudinal influences on women were actually stronger than normative influences. Therefore, one implication of these results may be that interventions to decrease the risk perceptions of using OCs (so that they could be bought without a physician's prescription) should attempt to modify women's perceptions (and any misconceptions referred to earlier) of adverse effects of OC use. This intervention is necessary prior to any intent on the part of policy makers to switch birth control pills to OTC category. Also, further investigation of women's subjective

norms needs to be done to gain additional insights into the relative importance of key referents in influencing the decisions about buying OCs OTC.

The focus of this research was the measurement of intention as a function of attitudes and subjective norm. The study questions were written to elicit information as they applied to the self and not others. For example, a woman's intention to acquire OCs was measured in relation to consequences that were believed to occur to one's own body and self. It was not the purpose of this study to measure what other women ("people like me, or "people I know") would have felt about acquiring OCs over-the-counter. Perceptions regarding what is appropriate for others, as opposed to the appropriateness for oneself, are bound to be different. For example, it is reasonable for women to think that, "I will not acquire OCs without a physician's prescription for myself, but it is probably a good idea for other women like me." Future research should explore this possibility. A measure of support for switching birth control pills to over-the-counter status may be best estimated when considerations for the self as well as for others are included in the framework. This study also did not examine the predictive influence of some demographic factors like age, race, religion, income, etc. on behavioral intention. Future investigations will do well to include these variables in the model for predicting ultimate behavior.

APPENDIX A
Study Questionnaire

Your opinion counts!

Birth Control Pills: Without a Prescription?



UNIVERSITY OF
FLORIDA

COLLEGE OF PHARMACY
Pharmacy Health Care Admin. Dept.

Questionnaire

I. The following are the consequences that have been sometimes associated with the use of birth control pills for some women. Some of these consequences may be of importance to you if you were to use the pills. We want you to think of the degree of "importance" that each consequence listed below has for you. For example, on a scale given below, your rating of 1 = Very Important, 5 = Very Unimportant. Now, circle one number that most accurately represents your attitude about each consequence.

| Possible consequences of using birth control pills | "Importance" this effect has for you when using birth control pills | | | | |
|---|---|-------|-------|-------|------------------|
| | Very Important | ----- | ----- | ----- | Very Unimportant |
| 1. Mild nausea lasting about 30 minutes | 1 | 2 | 3 | 4 | 5 |
| 2. Weight gain..... | 1 | 2 | 3 | 4 | 5 |
| 3. Pain in the legs..... | 1 | 2 | 3 | 4 | 5 |
| 4. Breast cancer..... | 1 | 2 | 3 | 4 | 5 |
| 5. Avoiding unplanned pregnancies..... | 1 | 2 | 3 | 4 | 5 |
| 6. Regulation of menstrual cycle..... | 1 | 2 | 3 | 4 | 5 |
| 7. Access to pills for emergency contraception (use as morning-after-pill)..... | 1 | 2 | 3 | 4 | 5 |
| 8. Convenience of use..... | 1 | 2 | 3 | 4 | 5 |
| 9. Personal expenditure of obtaining birth control pill..... | 1 | 2 | 3 | 4 | 5 |

II. Now, we would like you to think of each of the consequences listed below and imagine that you are considering obtaining birth control pills with a doctor's prescription. The scale attached to each of the consequences reflects the likelihood that a certain event might happen if you were to use pills bought with a doctor's prescription. Please tell us how likely you think it is that each outcome would result. (Circle one number for each response)

| Possible consequences of using birth control pills | How likely is it that these consequences would occur when pills are obtained with a doctor's prescription? | | | | |
|--|--|-------|-------|-------|---------------|
| | Very Likely | ----- | ----- | ----- | Very Unlikely |
| 1. Mild nausea lasting about 30 minutes | 1 | 2 | 3 | 4 | 5 |
| 2. Weight gain..... | 1 | 2 | 3 | 4 | 5 |
| 3. Pain in the legs..... | 1 | 2 | 3 | 4 | 5 |
| 4. Breast cancer..... | 1 | 2 | 3 | 4 | 5 |
| 5. Avoiding unplanned pregnancies..... | 1 | 2 | 3 | 4 | 5 |
| 6. Regulation of menstrual cycle..... | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| 7. Access to pills for emergency contraception (use as morning-after-pill)..... | 1 | 2 | 3 | 4 | 5 |
| 8. Convenience of use..... | 1 | 2 | 3 | 4 | 5 |
| 9. Higher personal expenditure for obtaining birth control pill..... | 1 | 2 | 3 | 4 | 5 |

III. Imagine that it is now legally possible for you to obtain birth control pills in one of the two ways: either from your family physician/gynecologist, or without a doctor's prescription. In other words, a person who wishes to acquire birth control pills for the first time would now have the option of going to a clinic and obtaining a prescription from her health care provider, or going to a local supermarket/ pharmacy/ grocery store to buy pills without such a prescription. Now, please tell us how likely you think it is that each consequence would result if you were to buy birth control pills without a doctor's prescription (Circle one number).

| Possible consequences of using birth control pills | How likely is it that these consequences would occur when pills are obtained <i>without</i> a doctor's prescription? | | | | |
|---|--|-------|-------|-------|---------------|
| | Very Likely | ----- | ----- | ----- | Very Unlikely |
| 1. Mild nausea lasting about 30 minutes | 1 | 2 | 3 | 4 | 5 |
| 2. Weight gain..... | 1 | 2 | 3 | 4 | 5 |
| 3. Pain in the legs..... | 1 | 2 | 3 | 4 | 5 |
| 4. Breast cancer..... | 1 | 2 | 3 | 4 | 5 |
| 5. Avoiding unplanned pregnancies..... | 1 | 2 | 3 | 4 | 5 |
| 6. Regulation of menstrual cycle..... | 1 | 2 | 3 | 4 | 5 |
| 7. Access to pills for emergency contraception (use as morning-after-pill)..... | 1 | 2 | 3 | 4 | 5 |
| 8. Convenience of use..... | 1 | 2 | 3 | 4 | 5 |
| 9. Higher personal expenditure for obtaining birth control pill..... | 1 | 2 | 3 | 4 | 5 |

IV In answering the following questions, we would like you to think of certain people important to you. Also, think of the hypothetical situation presented in the previous section where it was legally possible to obtain birth control pills without a doctor's prescription. Then circle the response that most accurately represents your perception of what these people would have liked you to do.

| People who may be important to you | If you decided to use birth control pills, how likely is it that these people would think you should buy the pills without a doctor's prescription? | | | | |
|------------------------------------|---|-------|-------|-------|---------------|
| | Very Likely | ----- | ----- | ----- | Very Unlikely |
| 1. Your family..... | 1 | 2 | 3 | 4 | 5 |
| 1. Your partner..... | 1 | 2 | 3 | 4 | 5 |
| 2. Your close friends..... | 1 | 2 | 3 | 4 | 5 |

V. Please tell us if you agree or disagree with the following statements (circle one response).

1. Generally speaking, I prefer to do what my family members think I should do.

STRONGLY STRONGLY
AGREE DISAGREE
1 2 3 4 5

2. Generally speaking, I prefer to do what my close friends think I should do.

STRONGLY STRONGLY
AGREE DISAGREE
1 2 3 4 5

3. Generally speaking, I prefer to do what my partner thinks I should do.

STRONGLY STRONGLY
AGREE DISAGREE
1 2 3 4 5

VI. Now, we want you to still think about the possibility of being able to obtain birth control pills legally without a physician's prescription. With that in mind, please proceed to answering the following questions.

1. Most people who are important to me and whose opinions I value would think that I should obtain my birth control pills without a doctor's prescription.

VERY VERY
LIKELY UNLIKELY
1 2 3 4 5

2. In my opinion, obtaining birth control pills over-the-counter, without a doctor's prescription would be:

EXTREMELY EXTREMELY
GOOD BAD
1 2 3 4 5

3. My attitude about obtaining birth control pills without a doctor's prescription is:

EXTREMELY EXTREMELY
UNFAVORABLE FAVORABLE
1 2 3 4 5

VII. Imagine that you are interested in using birth control pills to prevent pregnancy. Remember, you are imagining that it is legal to obtain pills in one of the two ways described in the previous section: either from your family physician/gynecologist, or without a doctor's prescription. Now, read the statement below and circle the number on the scale that most accurately represents your feelings about obtaining your birth control pills without a doctor's prescription.

1. Assuming that you have decided to use birth control pills, how likely is it that you would acquire them without a physician's prescription?

VERY VERY
LIKELY UNLIKELY
1 2 3 4 5

Now, please answer the following question (Circle one response).

1. How likely is it that you would decide to use birth control pills at all from among other forms of contraception?

VERY VERY
LIKELY UNLIKELY
1 2 3 4 5

VII. Finally, take a moment to answer some general questions about yourself. If at any point you do not want to answer any of the questions or are uncomfortable answering any of these questions, please feel free not to answer them. Your responses to these questions are strictly confidential.

Q-1. What is your present age?
_____ years

Q-2. Which of the following best describes your ethnicity? (circle number)

1. AFRICAN AMERICAN
2. WHITE
3. ASIAN AMERICAN
4. HISPANIC/LATINA
5. OTHER

Q-3. What is your religious preference? (circle number)

1. PROTESTANT
2. CATHOLIC
3. JEWISH
4. OTHER.....MENTION: _____

Q-4. Have you ever used birth control pills? (circle number)

1. YES
2. NO

Q-5. Are you currently using birth control pills? (circle number)

1. YES
2. NO (skip to Q-8)

Q-6. If you are currently using oral contraceptives, how long have you been using them? (circle number)

1. A FEW MONTHS
2. MORE THAN A YEAR
3. TWO YEARS OR MORE

Q-7. What health professional do you usually see when you want a prescription for oral contraceptives? (circle number)

1. DOCTOR
2. NURSE PRACTITIONER
3. MIDWIFE
4. OTHER

Q-8. If you are currently not using birth control pills, do you plan to use them sometime in the future? (circle number)

1. NO
2. YES
3. I DON'T KNOW

Q-9. Do you currently have insurance coverage for your prescription or nonprescription drugs, such as private insurance or Medicaid? (circle number)

1. YES
2. NO
3. I DON'T KNOW

Q-10. Do you currently have insurance covering your MD visits?

1. YES
2. NO
3. I DON'T KNOW

Please return the questionnaire in the preaddressed, stamped envelope enclosed with this survey after you have finished responding to all the questions.

We, at the College of Pharmacy, University of Florida, thank you for your participation in the study.



UNIVERSITY OF
FLORIDA

APPENDIX B
COVER LETTER FOR PILOT STUDY

DEAR UF STUDENT:

July 22, 1999

This is not just another survey. Your opinion about the possibility of obtaining birth control pills without a prescription is important. There have been proposals made recently by the health care community to sell birth control pills without a doctor's prescription. Surprisingly, such proposals have been made without taking into account the views of people like yourself. These proposals, if adopted, could greatly affect the way in which contraceptive choices are made by women today, particularly in terms of access, convenience and cost. However, no one really knows what women like yourself think about such access to birth control pills.

You are one of a small number of people being asked to give their opinion on these matters. You were drawn as part of a random sample of the entire University of Florida female student population. In order for the results to truly represent the thinking of female students, it is important that each questionnaire be completed and returned. Therefore, we would like the questionnaire to be completed only by you and nobody else.

You may be assured of complete confidentiality. It is expected that it will take about 10 to 12 minutes to complete the survey. We have provided an addressed and stamped envelope for you to return your survey. There is no cost to you, other than a few minutes of your time. Therefore, please take a moment of your time and let us know what you think. We would appreciate your input.

We would be most happy to answer any questions you might have. Please write or call. The telephone number is (352) 392-9035.

Thank you for your assistance.

Sincerely,

Rajesh Nayak, M.S. (Pharm.)
Principal Investigator
E-mail: nayak@cop3.health.ufl.edu

Carole L. Kimberlin, Ph.D.
Professor, Pharmacy Health Care Administration

APPENDIX C
MAIN STUDY COVER LETTER

September 15, 1998

Dear UF student:

This is not just another survey. Your opinion about the possibility of obtaining birth control pills without a prescription is important. There have been proposals made recently by the health care community to sell birth control pills without a doctor's prescription. Surprisingly, such proposals have been made without taking into account the views of people like yourself. These proposals, if adopted, could greatly affect the way in which contraceptive choices are made by women today, particularly in terms of access, convenience and cost. However, no one really knows what women like yourself think about such access to birth control pills.

You are one of a small number of people being asked to give their opinion on these matters. You were drawn as part of a random sample of the entire University of Florida female student population. In order for the results to truly represent the thinking of female students, it is important that each questionnaire be completed and returned. Therefore, we would like the questionnaire to be completed only by you and nobody else.

You may be assured of complete confidentiality. The questionnaire has an identification number for mailing purposes only. This is so that we may check your name off of the mailing list when the questionnaire is returned. Your name will never be placed on the questionnaire. It is expected that it will take about 10 to 12 minutes to complete the survey. We have provided an addressed and stamped envelope for you to return your survey. There is no cost to you, other than a few minutes of your time. Therefore, please take a moment of your time and let us know what you think. We would appreciate your input.

We would be most happy to answer any questions you might have. Please write or call. The telephone number is (352) 392-9035.

Thank you for your assistance.

Sincerely,

Rajesh Nayak, M.S. (Pharm.)
Principal Investigator
E-mail: nayak@cop3.health.ufl.edu

Carole L Kimberlin, Ph.D.
Professor, Pharmacy Health Care Administration

APPENDIX D
REMINDER POST CARD

September 30, 1998

Dear UF student

Two weeks ago a questionnaire seeking your opinion about acquiring birth control pills without a prescription was mailed to you. Your name was drawn in a random sample of female students attending the University of Florida. If you have already completed and returned the questionnaire to us, please accept our sincere thanks. If not, please do so today. Because it has been sent to only a small, but representative, sample of UF female students, it is extremely important that yours also be included in the study if the results are to accurately represent the opinions of UF female students. If you did not receive the questionnaire, or it got misplaced, please call me right away at 392-9035 and I will get another one in the mail to you today.

Sincerely,

Rajesh Nayak, M.S.
Principal Investigator
Administration

College of Pharmacy, University of Florida
Dept. of Pharmacy Health Care

PO Box 100496
Gainesville, FL 32610-0496
E-Mail: nayak@cop3.health.ufl.edu

APPENDIX E
SURVEY CENTER CALLSHEET

| | | | | | | |
|------|---|------|-------|------|--------|---------|
| Name | | Date | Time | Int. | Result | Comp |
| | 1 | | : A/P | | | [] |
| | 2 | | : A/P | | | |
| | 3 | | : A/P | | | |
| | 4 | | : A/P | | | |

| | | | | | | |
|------|---|------|-------|------|--------|---------|
| Name | | Date | Time | Int. | Result | Comp |
| | 1 | | : A/P | | | [] |
| | 2 | | : A/P | | | |
| | 3 | | : A/P | | | |
| | 4 | | : A/P | | | |

| | | | | | | |
|------|---|------|-------|------|--------|---------|
| Name | | Date | Time | Int. | Result | Comp |
| | 1 | | : A/P | | | [] |
| | 2 | | : A/P | | | |
| | 3 | | : A/P | | | |
| | 4 | | : A/P | | | |

| | | | | | | |
|------|---|------|-------|------|--------|---------|
| Name | | Date | Time | Int. | Result | Comp |
| | 1 | | : A/P | | | [] |
| | 2 | | : A/P | | | |
| | 3 | | : A/P | | | |
| | 4 | | : A/P | | | |

| | | | | | | |
|------|---|------|-------|------|--------|---------|
| Name | | Date | Time | Int. | Result | Comp |
| | 1 | | : A/P | | | [] |
| | 2 | | : A/P | | | |
| | 3 | | : A/P | | | |
| | 4 | | : A/P | | | |

NW - Non Working #
NH - Non Household #
NA - No Answer

BB - Busy
CB - Call Back
QF - Quota Filled

LB - Language Barrier
RF - Refusal
TQ - Terminate

IL - Ineligible
OT - Other

APPENDIX F
COMPARISON OF MAIL (N1) AND TELEPHONE (N2) SAMPLES

Independent Samples T-tests for Study Variables (n1=185, n2=109)

| Variable | t | Sig (2 tailed) | Mean difference | Std. Error |
|---|--------|-------------------|--------------------|------------|
| Intention to acquire OCs OTC | 2.113 | 0.035* | 0.4071 | 0.192 |
| Attitude toward acquiring OCs OTC (indirect measurement $\Sigma e_i b_i$) | -1.734 | 0.084 | -1.620 | 0.934 |
| Attitude toward acquiring OCs OTC (direct measurement) | -3.305 | 0.001** | -0.493 | 0.148 |
| Subjective Norm (Indirect $\Sigma NbMc$) | -1.707 | 0.089 | -0.8031 | 0.470 |
| Subjective Norm (Direct) | 0.539 | 0.590 | 0.0834 | 0.154 |
| NbXMc (Family) | -1.004 | 0.316 | -0.222 | 0.221 |
| NbXMc (Friend) | -1.420 | 0.157 | -0.265 | 0.187 |
| NbXMc (Partner) | -1.441 | 0.151 | -0.314 | 0.218 |
| Attitude toward risks ($\Sigma e_i b_i$) | 0.222 | 0.824 | 0.148 | 0.667 |
| Attitude toward benefits ($\Sigma e_i b_i$) | -3.331 | 0.001* | -1.834 | 0.550 |
| <u>Evaluation Subscale</u> | | | | |
| Nausea | 1.246 | 0.214 | 0.183 | 0.147 |
| Weight gain | -0.403 | 0.687 | -0.054 | 0.134 |
| Pain in the legs | 2.379 | 0.018* | 0.331 | 0.139 |
| Breast Cancer | 1.322 | 0.187 | 0.187 | 0.118 |
| Personal expenditure | -0.302 | 0.763 | -0.039 | 0.131 |
| Avoiding pregnancy | -1.201 | 0.231 | -0.083 | 0.073 |
| Regulation of Menstrual cycle | -0.071 | 0.944 | -0.099 | 0.140 |
| Access to morning-after-pill | -1.611 | 0.108 | -0.278 | 0.172 |
| Convenience | -1.478 | 0.140 | -0.172 | 0.116 |
| <u>Normative Belief</u> | | | | |
| Friend | -0.430 | 0.668 | -0.073 | 0.171 |
| Family | -0.884 | 0.377 | -0.148 | 0.167 |
| Partner | -1.002 | 0.317 | -0.187 | 0.187 |
| <u>Motivation to Comply</u> | | | | |
| Friend | 0.969 | 0.333 | 0.120 | 0.124 |
| Family | 0.973 | 0.332 | 0.130 | 0.134 |
| Partner | -0.994 | 0.321 | -0.123 | 0.124 |

| | | | | |
|--|--------|---------|--------|-------|
| <u>Likelihood Subscale (Physician)</u> | | | | |
| Nausea | 2.634 | 0.009** | 0.395 | 0.150 |
| Weight gain | 1.591 | 0.113 | 0.218 | 0.137 |
| Pain in the legs | -0.245 | 0.807 | -0.037 | 0.152 |
| Breast Cancer | 1.325 | 0.412 | 0.195 | 0.113 |
| Personal expenditure | 1.586 | 0.114 | 0.222 | 0.140 |
| Avoiding pregnancy | -0.113 | 0.910 | -0.014 | 0.131 |
| Regulation of Menstrual cycle | 0.827 | 0.409 | 0.100 | 0.121 |
| Access to morning-after-pill | -0.192 | 0.848 | -0.033 | 0.172 |
| Convenience | -2.930 | 0.004** | -0.408 | 0.139 |
| <u>Likelihood Subscale (OTC)</u> | | | | |
| Nausea | 3.531 | 0.000** | 0.525 | 0.148 |
| Weight gain | 1.253 | 0.211 | 0.157 | 0.125 |
| Pain in the legs | 1.098 | 0.273 | 0.166 | 0.151 |
| Breast Cancer | -1.518 | 0.130 | -0.235 | 0.155 |
| Personal expenditure | -2.147 | 0.033* | -0.358 | 0.166 |
| Avoiding pregnancy | -2.531 | 0.012* | -0.335 | 0.132 |
| Regulation of Menstrual cycle | -0.984 | 0.326 | -0.126 | 0.128 |
| Access to morning-after-pill | 1.616 | 0.107 | 0.278 | 0.172 |
| Convenience | 0.070 | 0.945 | -0.008 | 0.116 |
| <u>Evaluation X Belief (OTC)</u> | | | | |
| Nausea | -1.281 | 0.201 | -0.281 | 0.220 |
| Weight gain | -0.294 | 0.769 | -0.066 | 0.225 |
| Pain in the legs | 0.206 | 0.837 | 0.046 | 0.225 |
| Breast Cancer | 1.931 | 0.054 | 0.578 | 0.299 |
| Personal expenditure | 0.473 | 0.637 | 0.118 | 0.250 |
| Avoiding pregnancy | -2.551 | 0.011 | -0.682 | 0.267 |
| Regulation of Menstrual cycle | -2.018 | 0.044 | -0.471 | 0.233 |
| Access to morning-after-pill | -2.407 | 0.017 | -0.680 | 0.282 |
| Convenience | -0.684 | 0.494 | -0.180 | 0.264 |

* Significant at 0.05 level; ** significant at 0.01 level

Description of Crucial Study Variables

Group Statistics

| | CLASS | N | Mean | Std. Deviation | Std. Error Mean |
|-----------|-------|-----|---------|----------------|-----------------|
| ATTD_1 | 1.00 | 184 | 5.4E-03 | 1.3849 | .1021 |
| | 2.00 | 109 | .4954 | 1.0058 | 9.6E-02 |
| ATTD_2 | 1.00 | 184 | 3.3E-02 | 1.3983 | .1031 |
| | 2.00 | 109 | .5229 | .9775 | 9.4E-02 |
| AVG_ATT | 1.00 | 185 | 1.9E-02 | 1.3647 | .1003 |
| | 2.00 | 109 | .5092 | .9525 | 9.1E-02 |
| DIRECT_SN | 1.00 | 184 | -.6413 | 1.2639 | 9.3E-02 |
| | 2.00 | 109 | -.7248 | 1.3114 | .1256 |
| SUM_SN | 1.00 | 185 | -1.0324 | 3.7415 | .2751 |
| | 2.00 | 109 | -.2294 | 4.1447 | .3970 |
| SUM_OTC | 1.00 | 185 | 2.5081 | 7.4928 | .5509 |
| | 2.00 | 109 | 4.1284 | 8.1390 | .7796 |
| SUM_BEN | 1.00 | 185 | 3.3946 | 4.5886 | .3374 |
| | 2.00 | 109 | 5.2294 | 4.5167 | .4326 |
| SUM_RISK | 1.00 | 185 | -2.3838 | 4.7249 | .3474 |
| | 2.00 | 109 | -2.5321 | 6.6772 | .6396 |

Description of Evaluation Subscale Scores

Group Statistics

| | CLASS | N | Mean | Std. Deviation | Std. Error Mean |
|--------|-------|-----|---------|----------------|-----------------|
| BRST_I | 1.00 | 185 | -1.7351 | .7941 | 5.8E-02 |
| | 2.00 | 109 | -1.8532 | .6358 | 6.1E-02 |
| CONV_I | 1.00 | 185 | 1.1027 | 1.0136 | 7.5E-02 |
| | 2.00 | 109 | 1.2752 | .8806 | 8.4E-02 |
| ECP_I | 1.00 | 185 | .3730 | 1.4051 | .1033 |
| | 2.00 | 109 | .6514 | 1.4743 | .1412 |
| EXP_1 | 1.00 | 185 | -.8378 | 1.0813 | 7.9E-02 |
| | 2.00 | 109 | -.7982 | 1.1037 | .1057 |
| PAIN_I | 1.00 | 185 | -.6865 | 1.2154 | 8.9E-02 |
| | 2.00 | 109 | -1.0183 | 1.0451 | .1001 |
| WGHT_I | 1.00 | 185 | -.9351 | 1.0765 | 7.9E-02 |
| | 2.00 | 109 | -.8807 | 1.1842 | .1134 |
| MENS_I | 1.00 | 185 | .8432 | 1.1760 | 8.6E-02 |
| | 2.00 | 109 | .8532 | 1.1452 | .1097 |
| NAUS_I | 1.00 | 185 | -.1838 | 1.2153 | 8.9E-02 |
| | 2.00 | 109 | -.3670 | 1.2222 | .1171 |
| PREG_I | 1.00 | 185 | 1.8108 | .7008 | 5.2E-02 |
| | 2.00 | 109 | 1.8991 | .4070 | 3.9E-02 |

Description of Likelihood Subscale Scores (OTC)**Group Statistics**

| | CLASS | N | Mean | Std. Deviation | Std. Error Mean |
|----------|-------|-----|---------|-------------------|--------------------|
| BRST_OTC | 1.00 | 183 | .1311 | 1.1360 | 8.4E-02 |
| | 2.00 | 109 | .3670 | 1.5010 | .1438 |
| CONV_OTC | 1.00 | 183 | 1.3934 | .9425 | 7.0E-02 |
| | 2.00 | 109 | 1.3853 | .9992 | 9.6E-02 |
| ECP_OTC | 1.00 | 183 | .8197 | 1.4317 | .1058 |
| | 2.00 | 109 | .5413 | 1.4111 | .1352 |
| EXP_OTC | 1.00 | 183 | 2.7E-02 | 1.3725 | .1015 |
| | 2.00 | 109 | .3853 | 1.3872 | .1329 |
| MENS_OTC | 1.00 | 183 | .9836 | 1.0663 | 7.9E-02 |
| | 2.00 | 109 | 1.1101 | 1.0571 | .1012 |
| NAUS_OTC | 1.00 | 183 | .6995 | 1.0754 | 7.9E-02 |
| | 2.00 | 109 | .1743 | 1.4520 | .1391 |
| PAIN_OTC | 1.00 | 183 | .2951 | 1.1485 | 8.5E-02 |
| | 2.00 | 109 | .1284 | 1.4149 | .1355 |
| PREG_OTC | 1.00 | 183 | 1.0219 | 1.1141 | 8.2E-02 |
| | 2.00 | 109 | 1.3578 | 1.0674 | .1022 |
| WGHT_OTC | 1.00 | 183 | 1.0656 | .9175 | 6.8E-02 |
| | 2.00 | 109 | .9083 | 1.2137 | .1162 |

Group Statistics

| | CLASS | N | Mean | Std. Deviation | Std. Error Mean |
|---------|-------|-----|---------|----------------|-----------------|
| CONV_MD | 1.00 | 182 | .8297 | 1.1068 | 8.2E-02 |
| | 2.00 | 109 | 1.2385 | 1.2240 | .1172 |
| ECP_MD | 1.00 | 184 | .2880 | 1.4252 | .1051 |
| | 2.00 | 109 | .3211 | 1.4200 | .1360 |
| EXP_MD | 1.00 | 182 | .9286 | 1.0875 | 8.1E-02 |
| | 2.00 | 109 | .7064 | 1.2642 | .1211 |
| INS_MD | 1.00 | 184 | 1.3533 | .6097 | 4.5E-02 |
| | 2.00 | 109 | 1.1835 | .4120 | 3.9E-02 |
| MENS_MD | 1.00 | 184 | 1.4402 | 1.0009 | 7.4E-02 |
| | 2.00 | 109 | 1.3394 | 1.0204 | 9.8E-02 |
| NAUS_MD | 1.00 | 184 | 9.2E-02 | 1.1246 | 8.3E-02 |
| | 2.00 | 109 | -.3028 | 1.4175 | .1358 |
| PAIN_MD | 1.00 | 184 | -.3859 | 1.1395 | 8.4E-02 |
| | 2.00 | 109 | -.3486 | 1.4361 | .1376 |
| PREG_MD | 1.00 | 184 | 1.4348 | 1.0743 | 7.9E-02 |
| | 2.00 | 109 | 1.4495 | 1.1012 | .1055 |
| WGHT_MD | 1.00 | 184 | .6957 | 1.0268 | 7.6E-02 |
| | 2.00 | 109 | .4771 | 1.3024 | .1247 |

Description of Likelihood Subscale scores (MD)

Group Statistics

| | CLASS | N | Mean | Std. Deviation | Std. Error Mean |
|----------|-------|-----|---------|----------------|-----------------|
| EXB1_OTC | 1.00 | 185 | -.4378 | 1.5838 | .1164 |
| | 2.00 | 109 | -.1560 | 2.1695 | .2078 |
| EXB2_OTC | 1.00 | 185 | -1.1946 | 1.7179 | .1263 |
| | 2.00 | 109 | -1.1284 | 2.0910 | .2003 |
| EXB3_OTC | 1.00 | 185 | -.4216 | 1.6470 | .1211 |
| | 2.00 | 109 | -.4679 | 2.1840 | .2092 |
| EXB4_OTC | 1.00 | 185 | -.3297 | 2.1905 | .1610 |
| | 2.00 | 109 | -.9083 | 2.9108 | .2788 |
| EXB5_OTC | 1.00 | 185 | 1.9135 | 2.2417 | .1648 |
| | 2.00 | 109 | 2.5963 | 2.1736 | .2082 |
| EXB6_OTC | 1.00 | 185 | .9135 | 1.9954 | .1467 |
| | 2.00 | 109 | 1.3853 | 1.8303 | .1753 |
| EXB7_OTC | 1.00 | 185 | .5676 | 2.3995 | .1764 |
| | 2.00 | 109 | 1.2477 | 2.2367 | .2142 |
| EXB8_OTC | 1.00 | 185 | 1.6541 | 2.1314 | .1567 |
| | 2.00 | 109 | 1.8349 | 2.2832 | .2187 |
| EXB9_OTC | 1.00 | 185 | -.1568 | 1.9925 | .1465 |
| | 2.00 | 109 | -.2752 | 2.2064 | .2113 |

Description of Evaluation X Belief Products (OTC)

Description of Subjective Norm component Scores

Group Statistics

| | CLASS | N | Mean | Std. Deviation | Std. Error Mean |
|----------|-------|-----|---------|----------------|-----------------|
| FLY_NB | 1.00 | 184 | -.8641 | 1.3861 | .1022 |
| | 2.00 | 109 | -.7156 | 1.3950 | .1336 |
| FRND_NB | 1.00 | 183 | -.2295 | 1.4110 | .1043 |
| | 2.00 | 109 | -.1560 | 1.4219 | .1362 |
| PRTNR_NB | 1.00 | 184 | -.2609 | 1.5426 | .1137 |
| | 2.00 | 109 | -.7E-02 | 1.5558 | .1490 |
| FLY_MC | 1.00 | 184 | .2500 | 1.0877 | 8.0E-02 |
| | 2.00 | 109 | .1193 | 1.1525 | .1104 |
| FRND_MC | 1.00 | 184 | -.2283 | .9874 | 7.3E-02 |
| | 2.00 | 109 | -.3486 | 1.0919 | .1046 |
| PRTNR_MC | 1.00 | 184 | .3533 | 1.0190 | 7.5E-02 |
| | 2.00 | 109 | .4771 | 1.0505 | .1008 |

Group Statistics

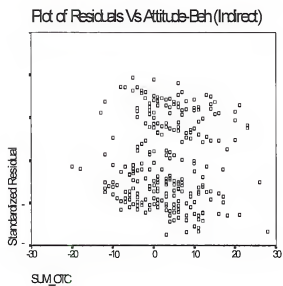
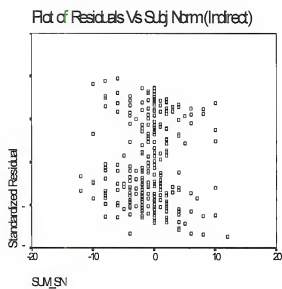
| | CLASS | N | Mean | Std. Deviation | Std. Error Mean |
|----------|-------|-----|---------|----------------|-----------------|
| NBXMC_FM | 1.00 | 185 | -.3514 | 1.8120 | .1332 |
| | 2.00 | 109 | -.1284 | 1.8812 | .1802 |
| NBXMC_FR | 1.00 | 185 | -.2108 | 1.4348 | .1055 |
| | 2.00 | 109 | 5.5E-02 | 1.7312 | .1658 |
| NBXMC_PR | 1.00 | 185 | -.4703 | 1.6877 | .1241 |
| | 2.00 | 109 | -.1560 | 1.9915 | .1908 |

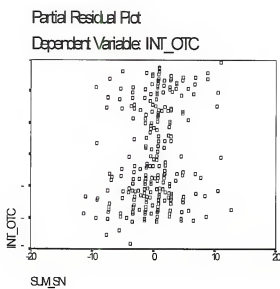
Independent Samples T-test for Age and Intention to Use OCs in the Future

Group Statistics

| | CLASS | N | Mean | Std. Deviation | Std. Error Mean |
|--------|-------|-----|---------|----------------|-----------------|
| AGE | 1.00 | 183 | 24.4538 | 6.6528 | .4918 |
| | 2.00 | 109 | 25.3578 | 7.7046 | .7380 |
| INT_OC | 1.00 | 183 | 1.1311 | 1.2900 | 9.5E-02 |
| | 2.00 | 109 | .9266 | 1.4575 | .1396 |

APPENDIX G RESIDUAL PLOTS FROM MULTIPLE REGRESSION



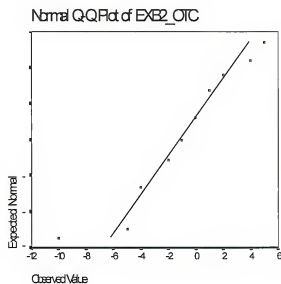
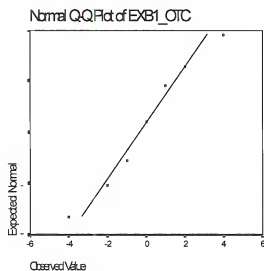


APPENDIX H TEST OF MANOVA ASSUMPTIONS

Tests of Normality

| | Kolmogorov-Smirnov ^a | | |
|----------|---------------------------------|-----|------|
| | Statistic | df | Sig. |
| EXB1_OTC | .217 | 294 | .000 |
| EXB2_OTC | .148 | 294 | .000 |
| EXB3_OTC | .213 | 294 | .000 |
| EXB4_OTC | .158 | 294 | .000 |

a. Lilliefors Significance Correction



APPENDIX I TEST OF MANOVA ASSUMPTIONS -- HOMOGENEITY OF VARIANCE

Univariate Homogeneity of Variance Tests

Variable: Nausea
 Cochrans C(135,2) = .55511, P = .200 (approx.)
 Bartlett-Box F(1,193872) = 1.59327, P = .207

Variable: Weight Gain
 Cochrans C(135,2) = .52798, P = .516 (approx.)
 Bartlett-Box F(1,193872) = .40584, P = .524

Variable: Pain in the legs
 Cochrans C(135,2) = .51388, P = .747 (approx.)
 Bartlett-Box F(1,193872) = .09931, P = .753

Variable: Breast Cancer
 Cochrans C(135,2) = .50562, P = .896 (approx.)
 Bartlett-Box F(1,193872) = .01627, P = .899

Cell Number: 1

Variance-Covariance matrix

| | <u>B_1</u> | B_2 | B_3 | B_4 |
|-----|------------|-------|-------|-------|
| B_1 | 1.638 | | | |
| B_2 | .434 | 1.156 | | |
| B_3 | .720 | .404 | 1.569 | |
| B_4 | .638 | .408 | .987 | 1.688 |

Cell Number: 2

Variance-Covariance matrix

| | <u>B_1</u> | B_2 | B_3 | B_4 |
|-----|------------|-------|-------|-------|
| B_1 | 1.312 | | | |
| B_2 | .477 | 1.033 | | |
| B_3 | .999 | .552 | 1.484 | |
| B_4 | .541 | .229 | .918 | 1.651 |

Pooled within-cells Variance-Covariance matrix

| | <u>B_1</u> | B_2 | B_3 | B_4 |
|-----|------------|-------|-------|-------|
| B_1 | 1.442 | | | |
| B_2 | .460 | 1.082 | | |
| B_3 | .888 | .493 | 1.518 | |
| B_4 | .580 | .300 | .945 | 1.666 |

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BIOGRAPHICAL SKETCH

Rajesh A Nayak was born in Udupi, India, in 1967. He received his Bachelor of Pharmacy degree (B.Pharm.) in June of 1988 and Master of Pharmacy degree (M. Pharm.), in medicinal chemistry, in June of 1990 from Mangalore University, India. His professional experience includes one-year of teaching at the College of Pharmaceutical Sciences, Manipal, India. Prior to joining the Pharmacy Health Care Administration program at the University of Florida in August of 1992, he also completed preliminary, postgraduate coursework towards an MBA degree at University of Central Oklahoma, Edmond, Oklahoma.


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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



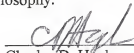
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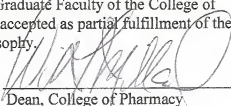
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